CONSOLIDATED SCHOOLS
IN
MINNESOTA

Book C

PLANS AND SPECIFICATIONS
FOUR-ROOM BUILDINGS

PREPARED UNDER THE DIRECTION OF
C. G. SCHULZ
Superintendent of Public Instruction
BY
F. E. HALDEN, Architect, Minneapolis

JANUARY 1912

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DEPARTMENT OF PUBLIC INSTRUCTION,
MINNESOTA

INTRODUCTION

This publication has been prepared with much care and at considerable expense. Its purpose is to aid county superintendents and rural school boards in schoolhouse architecture. In both planning and erection, school buildings should receive much more intelligent thought and attention than hitherto.

The first question of importance is that of a suitable site. The factors that enter into this are: (1) accessibility for the greater number of children in the district; (2) nearness to public roads; (3) elevation and drainage; (4) adaptability of the soil for trees. School buildings should not be on or near low or undrained ground. The site should afford ample room for play ground; the school law requires that it shall contain not less than two acres, when practicable. In consolidated districts the site must contain not less than two acres.

The children have the right to be housed in a building that is inviting from the standpoints of location, exterior appearance, and inside arrangement; and the right to exercise on school grounds that have been beautified by the planting of trees and shrubbery, and the laying of walks.

Do not plan for only the immediate present; bear in mind that the new building is to answer for at least twenty-five years. Make it sufficiently large to meet the increasing demands of attendance and modern education, and provide in it cloakrooms, a library room, and the other conveniences indicated in the drawings and the specifications. The schoolhouse should be regarded as the common home of the children, and should serve as their social, as well as educational, centre.

The conditions as to sanitation must be fully met. Be sure to observe the rules and requirements of the State Board of Health with regard to the lighting, heating, and ventilating of new school buildings.

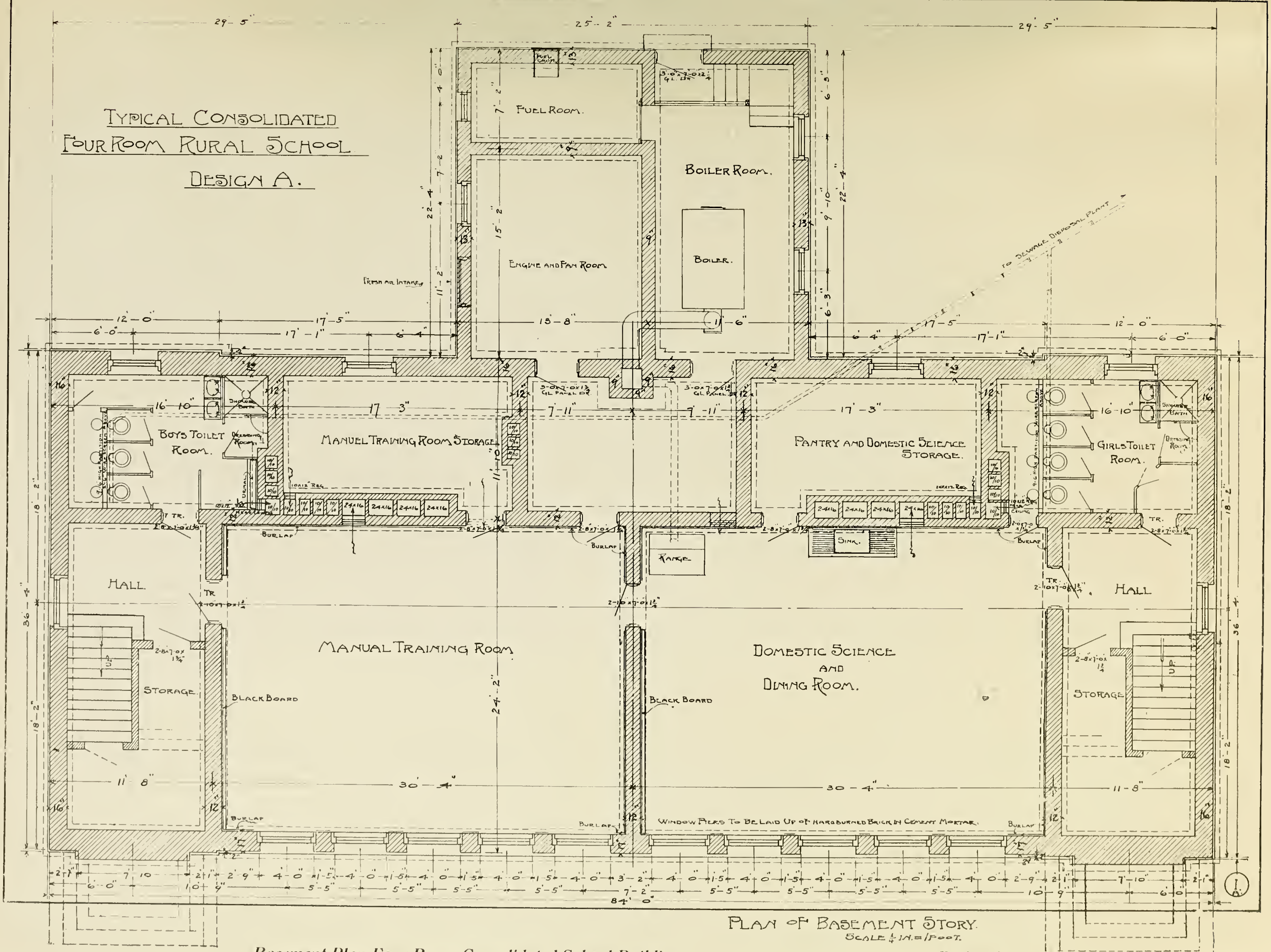
It is about as cheap to build a schoolhouse that is beautiful, substantial, and commodious as it is to put up one that is unattractive in its appearance, temporary in its construction and use, and cramped in its proportions. Our rural schoolhouses should not only be in visual harmony with our fine natural scenery and picturesque farms, but should express in some measure the prosperity that accrues to the people of Minnesota from her forests, her mines, her prairies, her lakes.

PLANS—School boards will understand that the plans given in this book are designed as types—hence suggestive. It is not understood that they must be followed in every detail where different and better plans can be secured. School boards are required to submit their plans and specifications for consolidated buildings to this Department before the contract is let or the work undertaken.

It will prove to be a matter of economy, and better work in construction will be done if a competent and reliable supervising architect or superintendent of construction is placed in charge of the erection of the building.

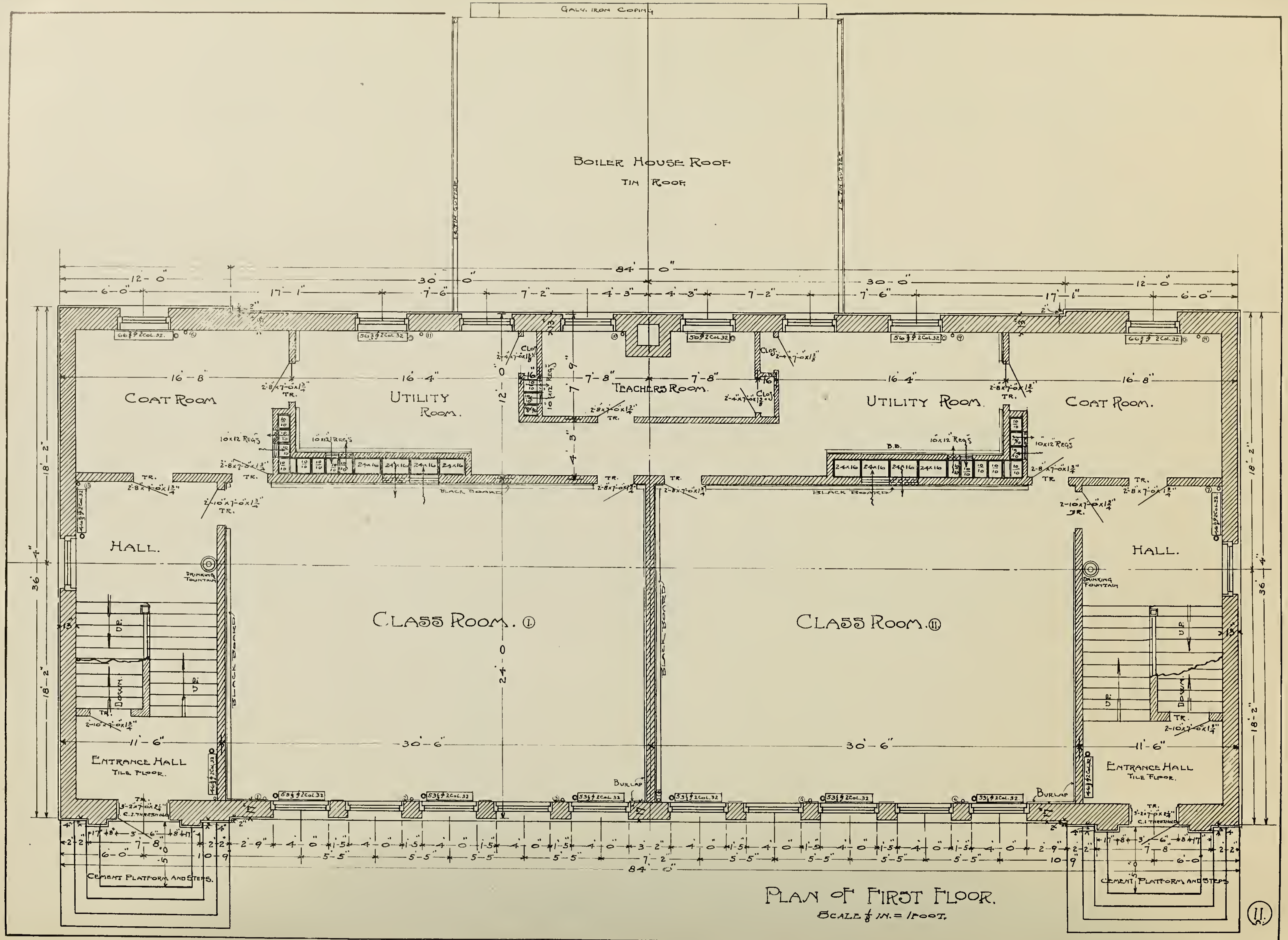
C. G. SCHULZ,
Superintendent of Public Instruction.

ST. PAUL, January, 1912.

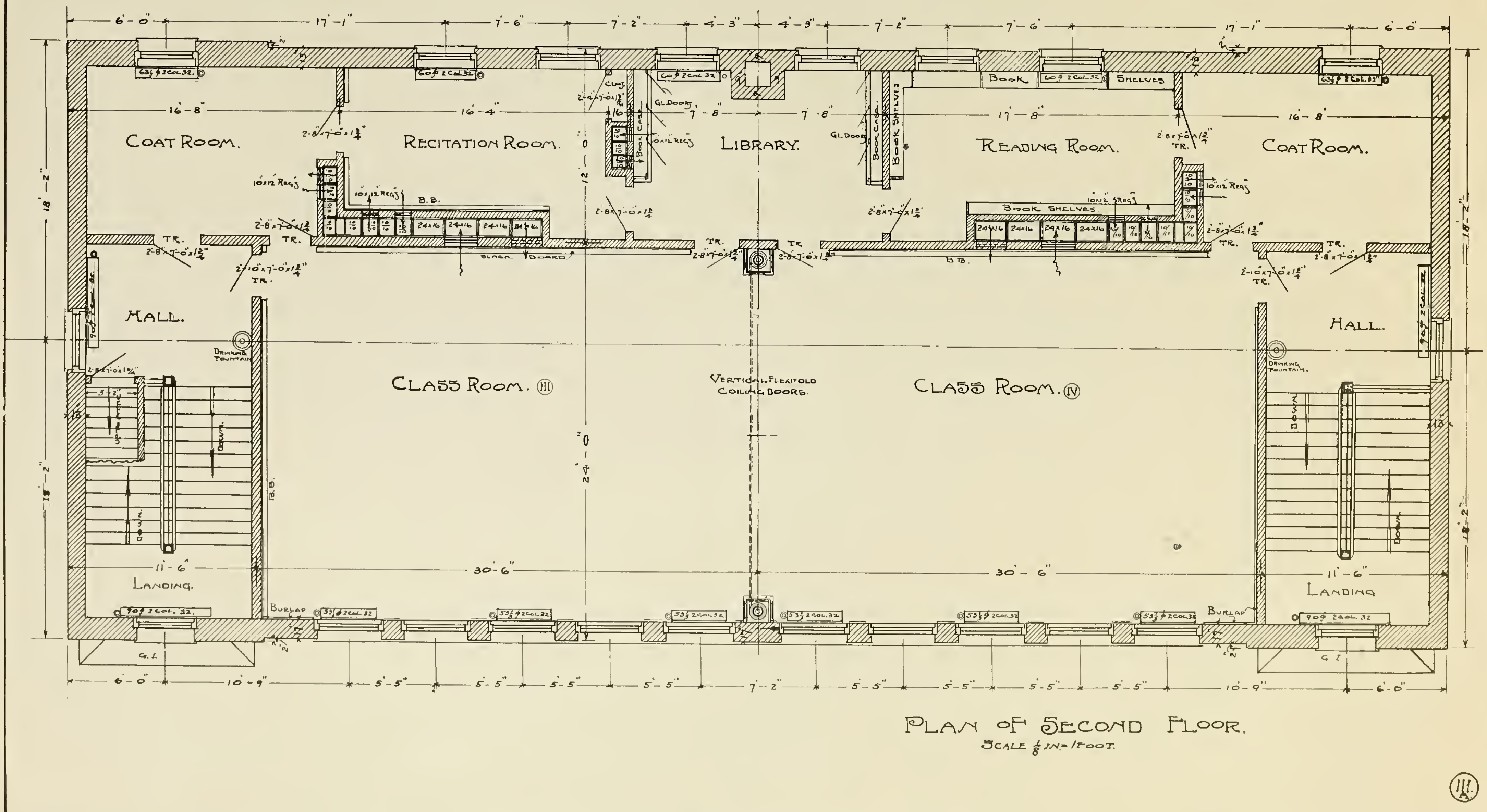


Basement Plan Four-Room Consolidated School Building.

Design 6

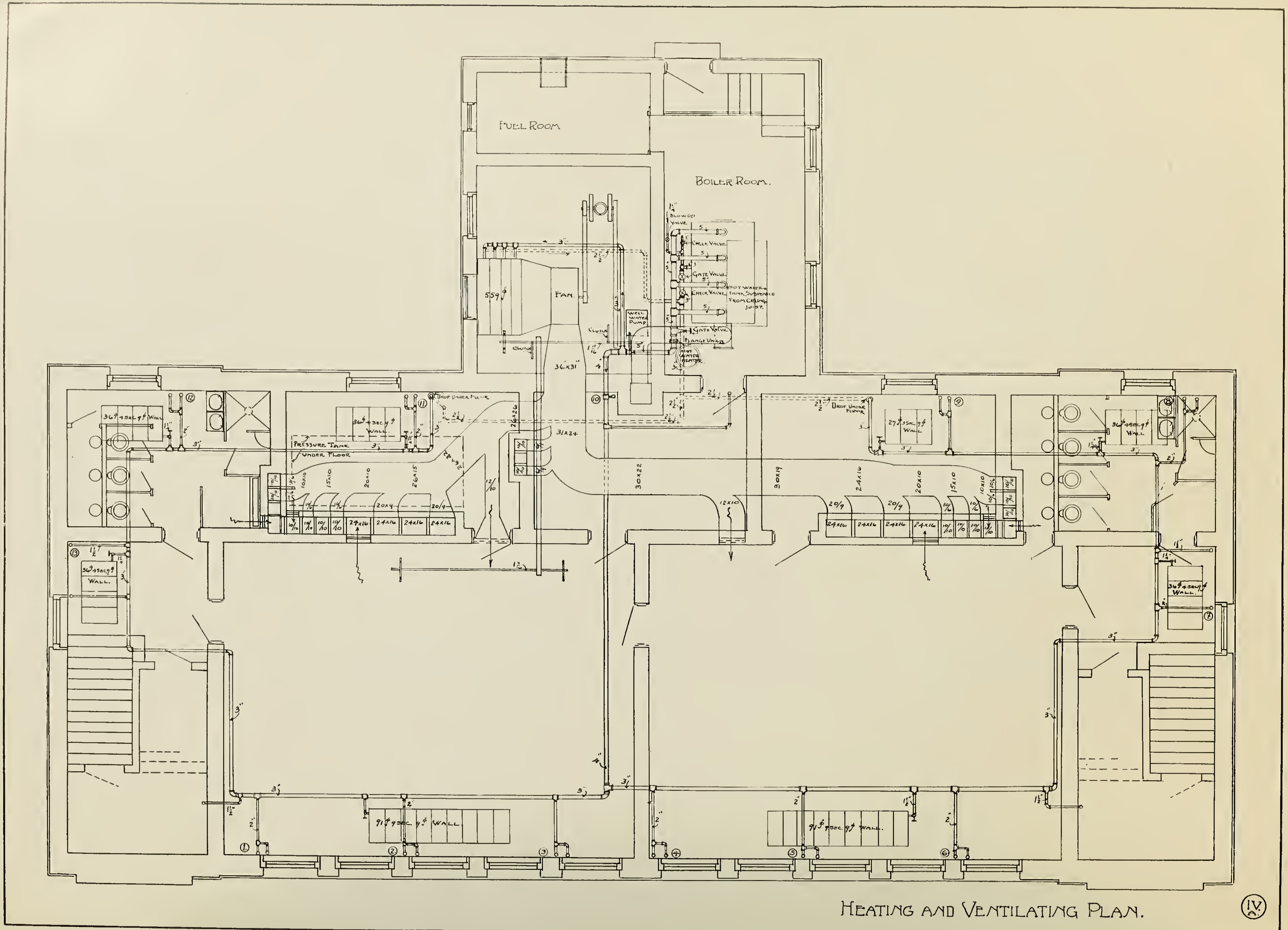


First Floor Plan Four-Room Consolidated School Building



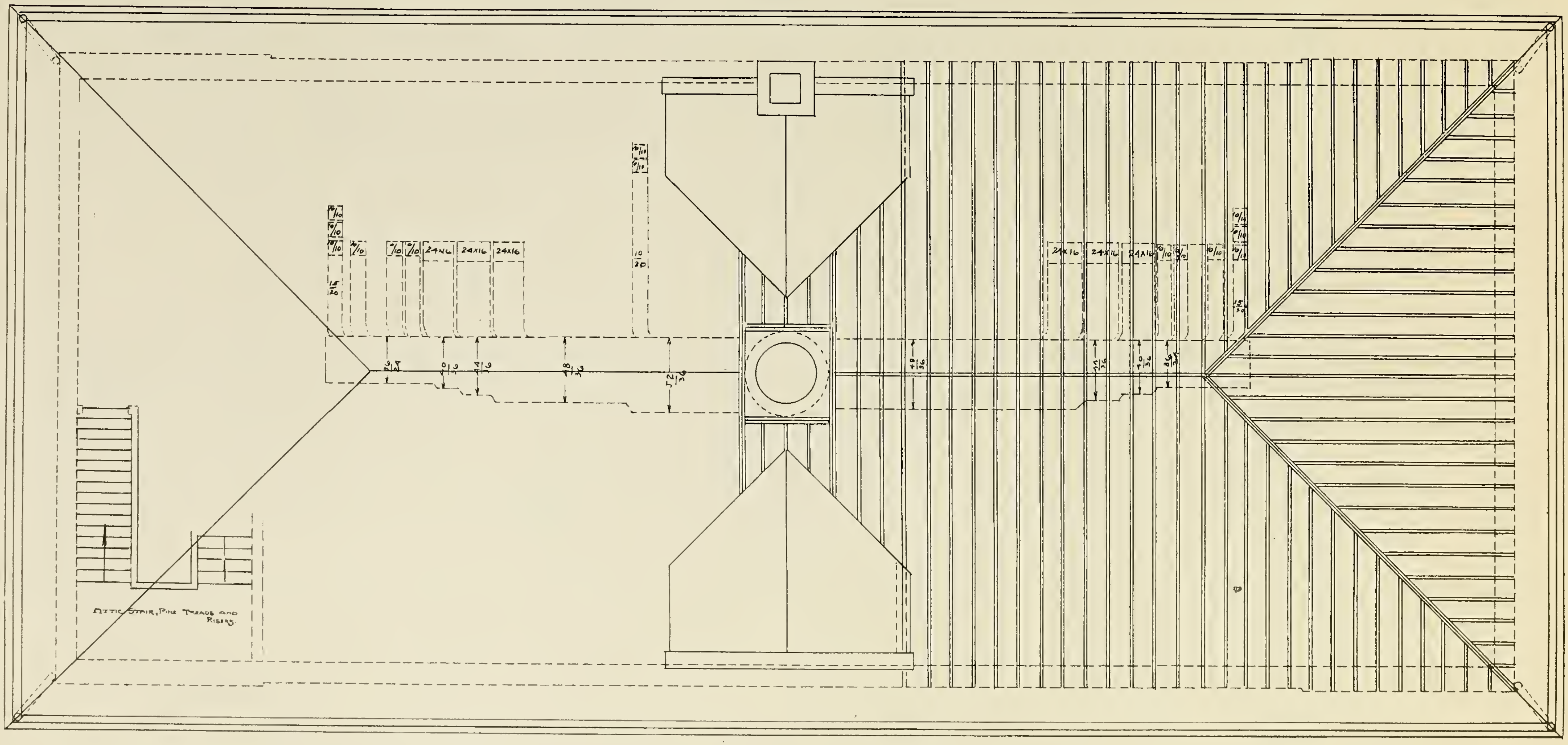
Second Floor Plan Four-Room Consolidated School Building.

Design 6

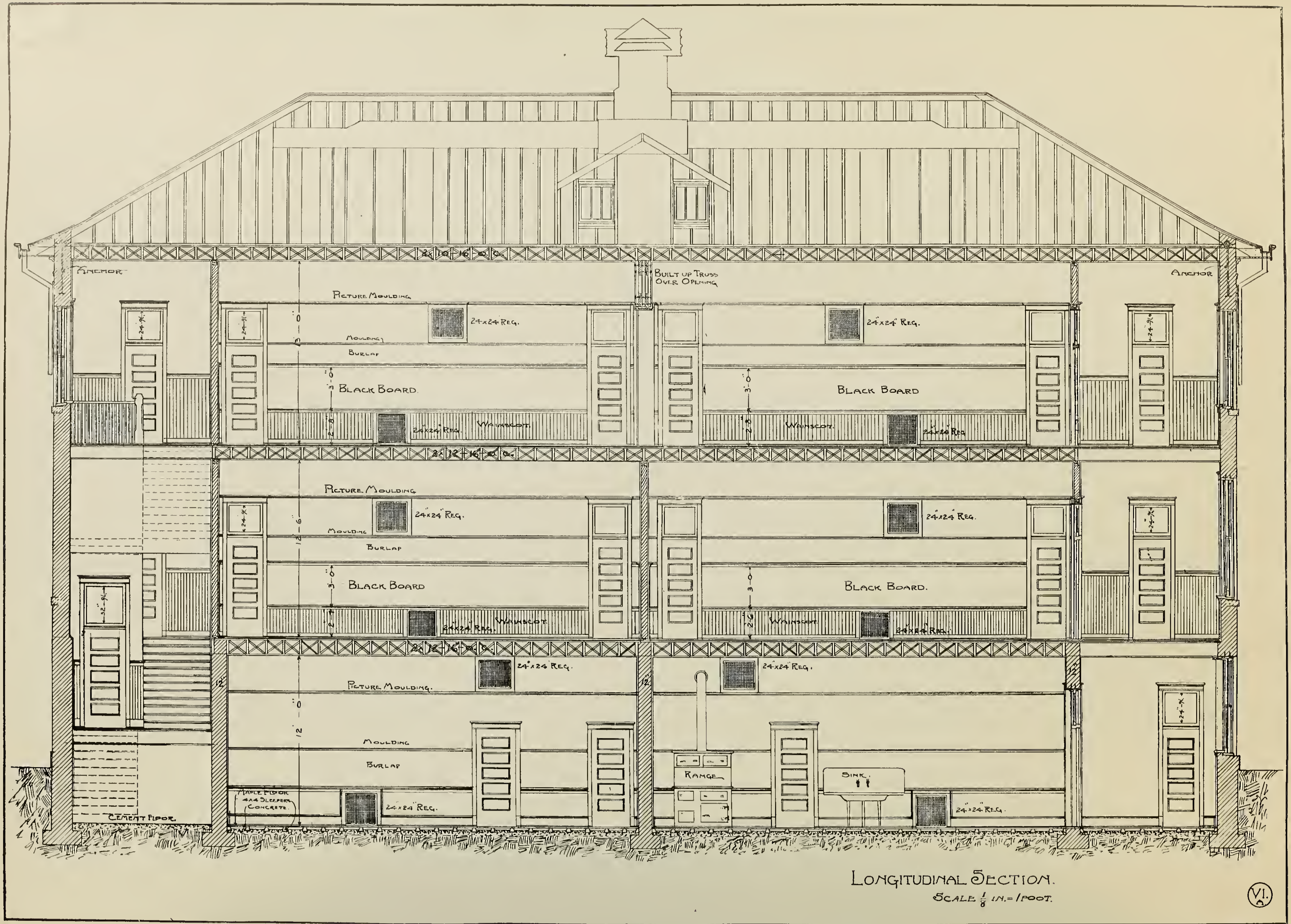


Heating and Ventilating Plans Four-Room Consolidated School Building

Design 6

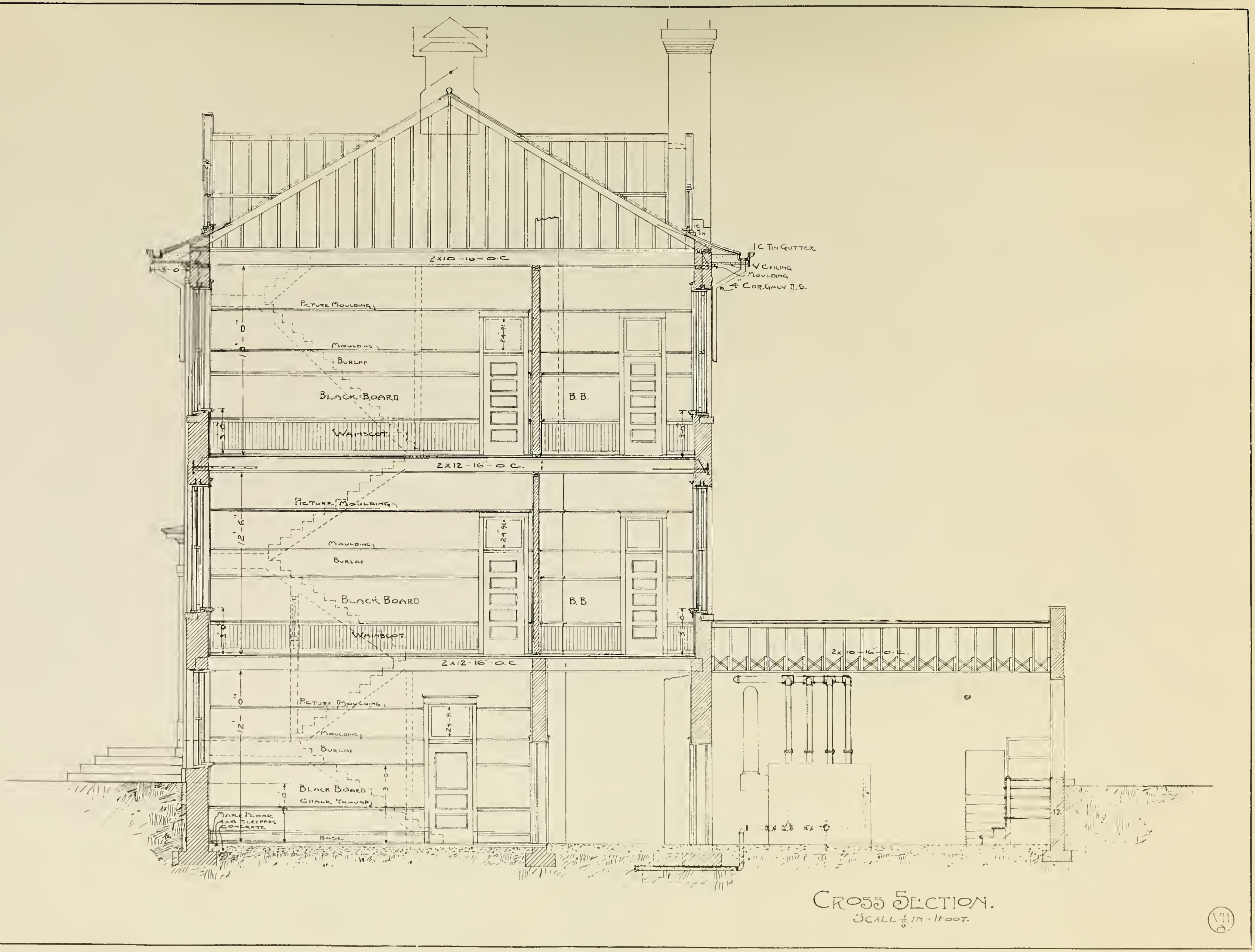


PLAN OF ATTIC AND ROOF.



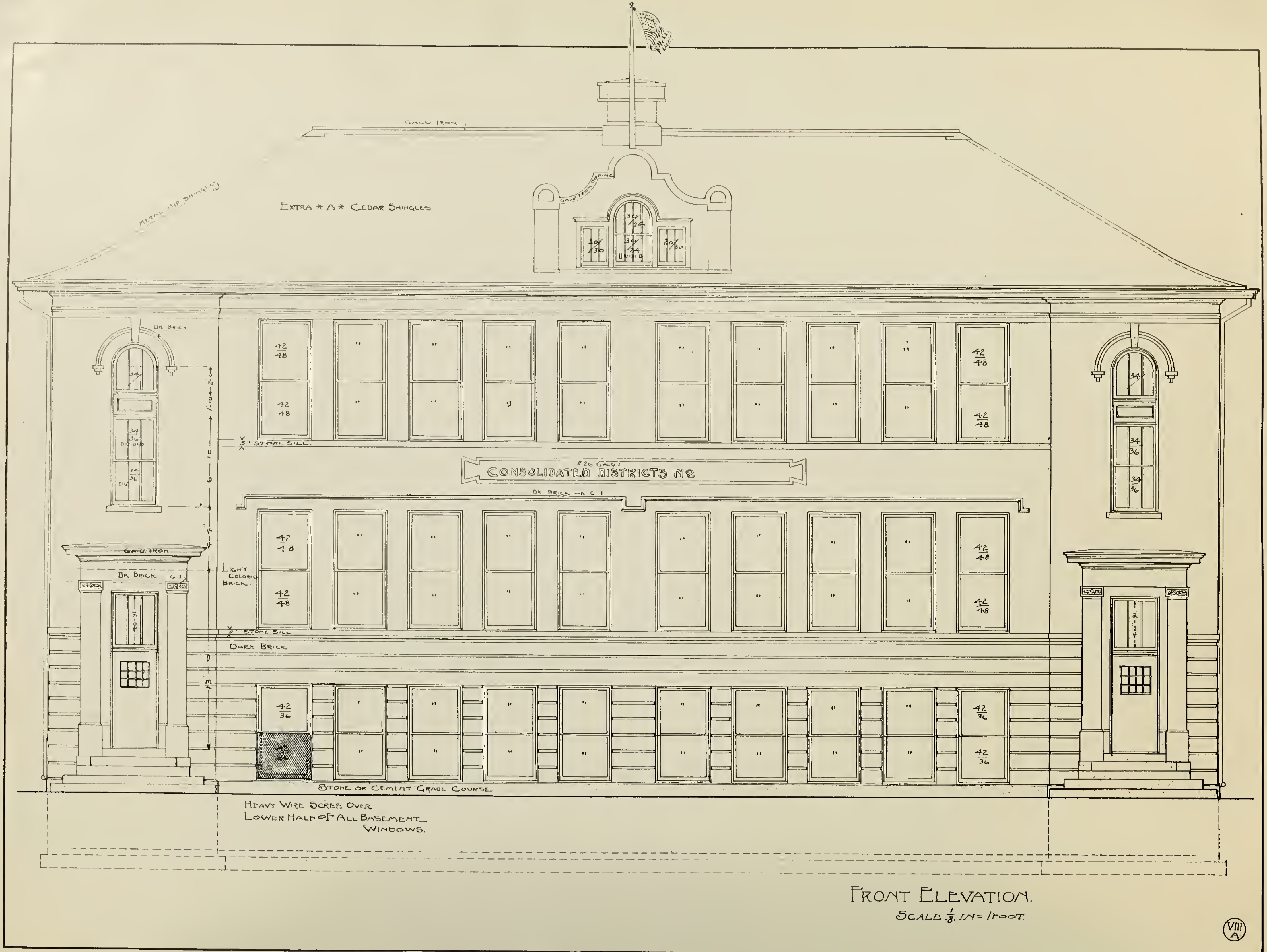
Longitudinal Section Four-Room Consolidated School Building.

Design 6

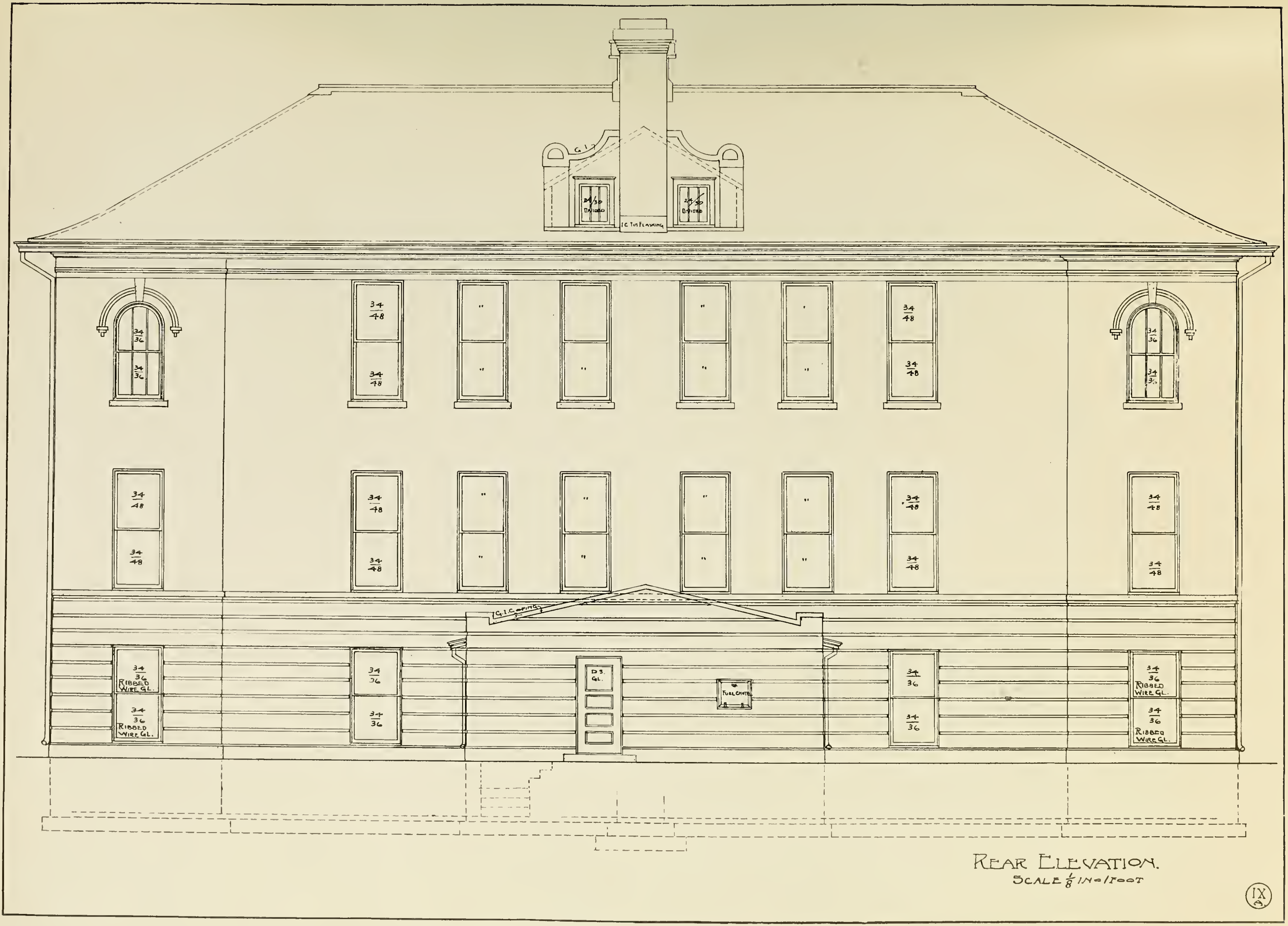


Cross Section Four-Room Consolidated School Building.

Design 6

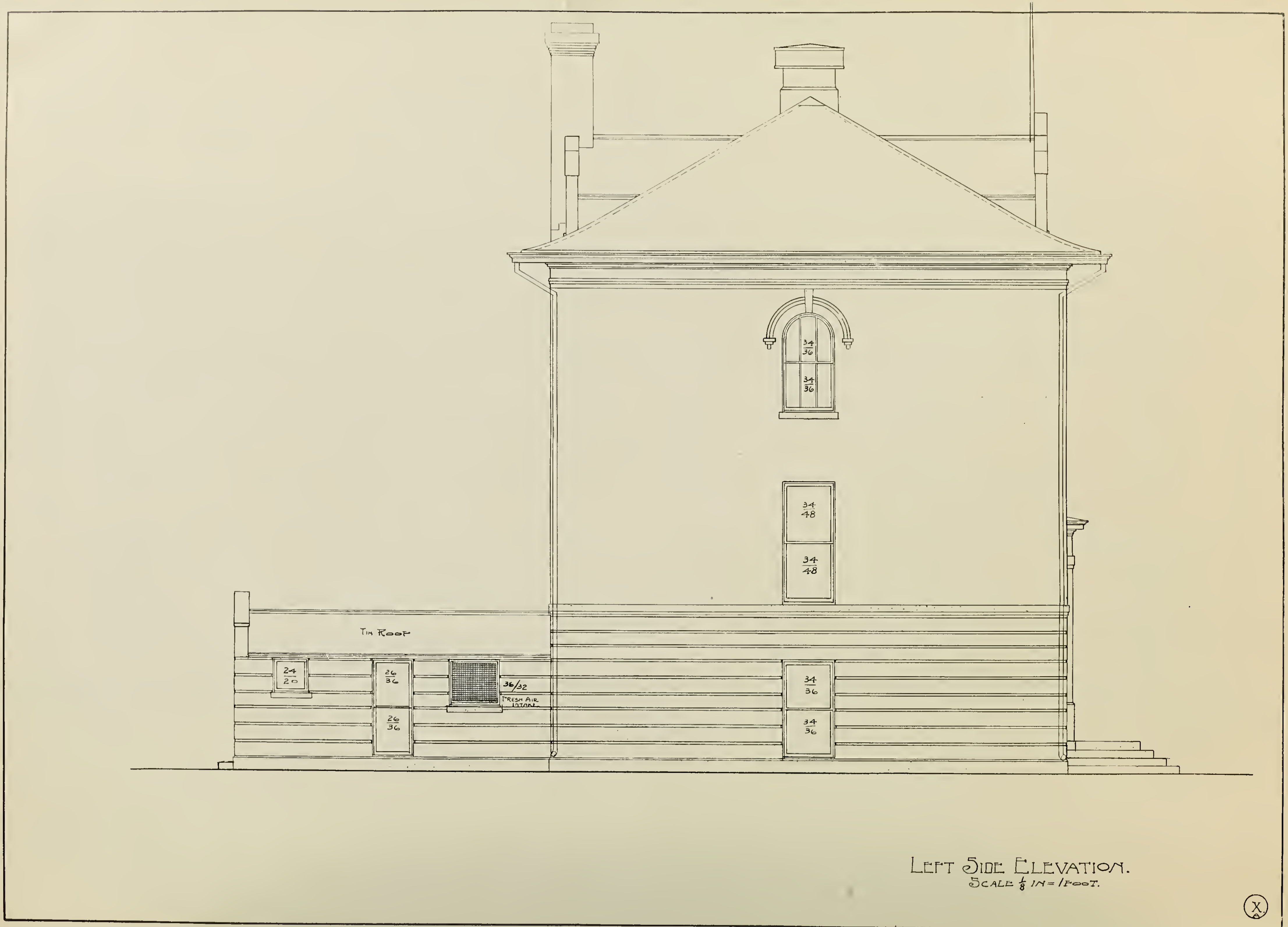


Front Elevation Four-Room Consolidated School Building **Design 6**



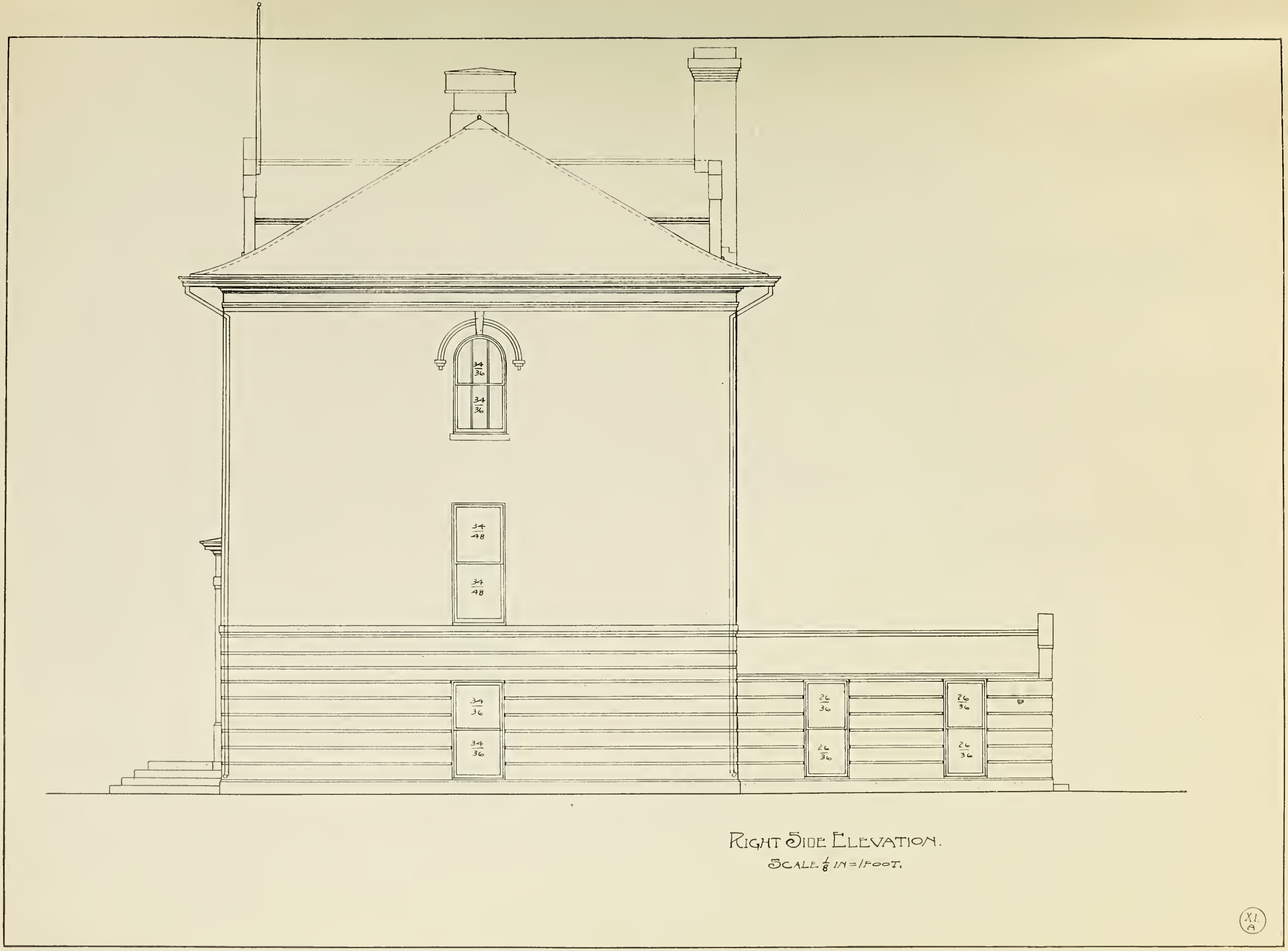
Rear Elevation Four-Room Consolidated School Building.

Design 6

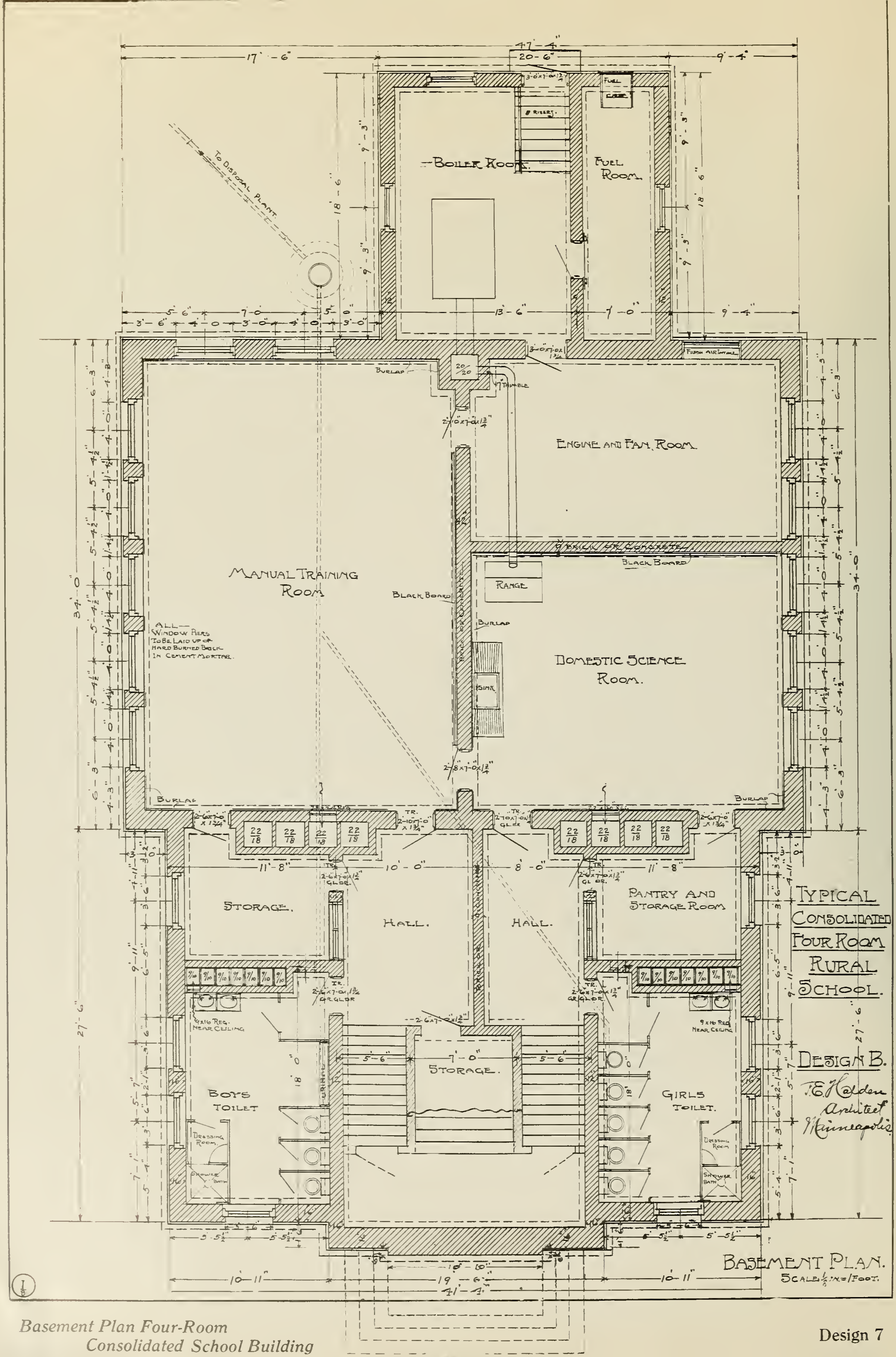


Left Side Elevation Four-Room Consolidated School Building.

Design 6

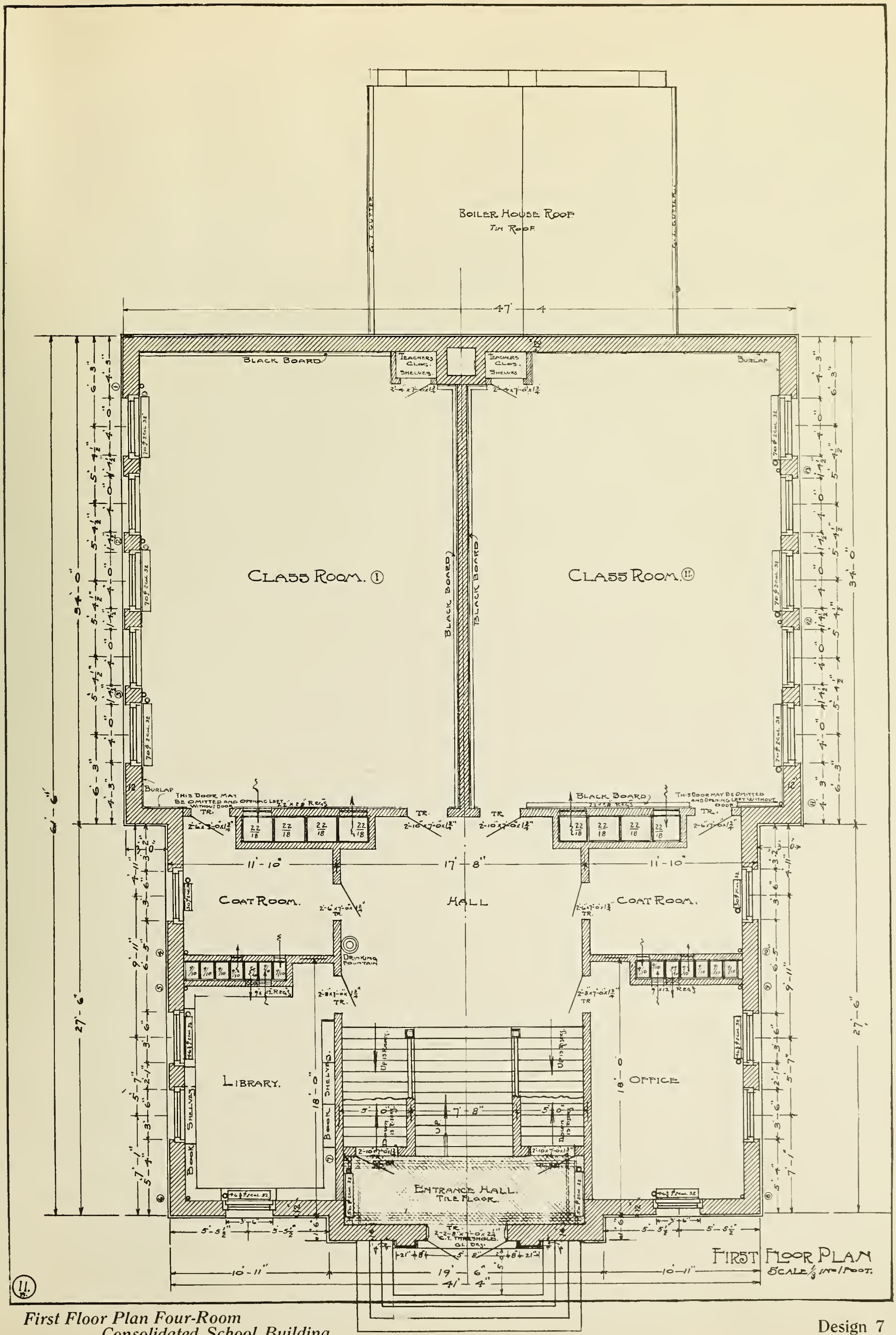


Right Side Elevation Four-Room Consolidated School Building



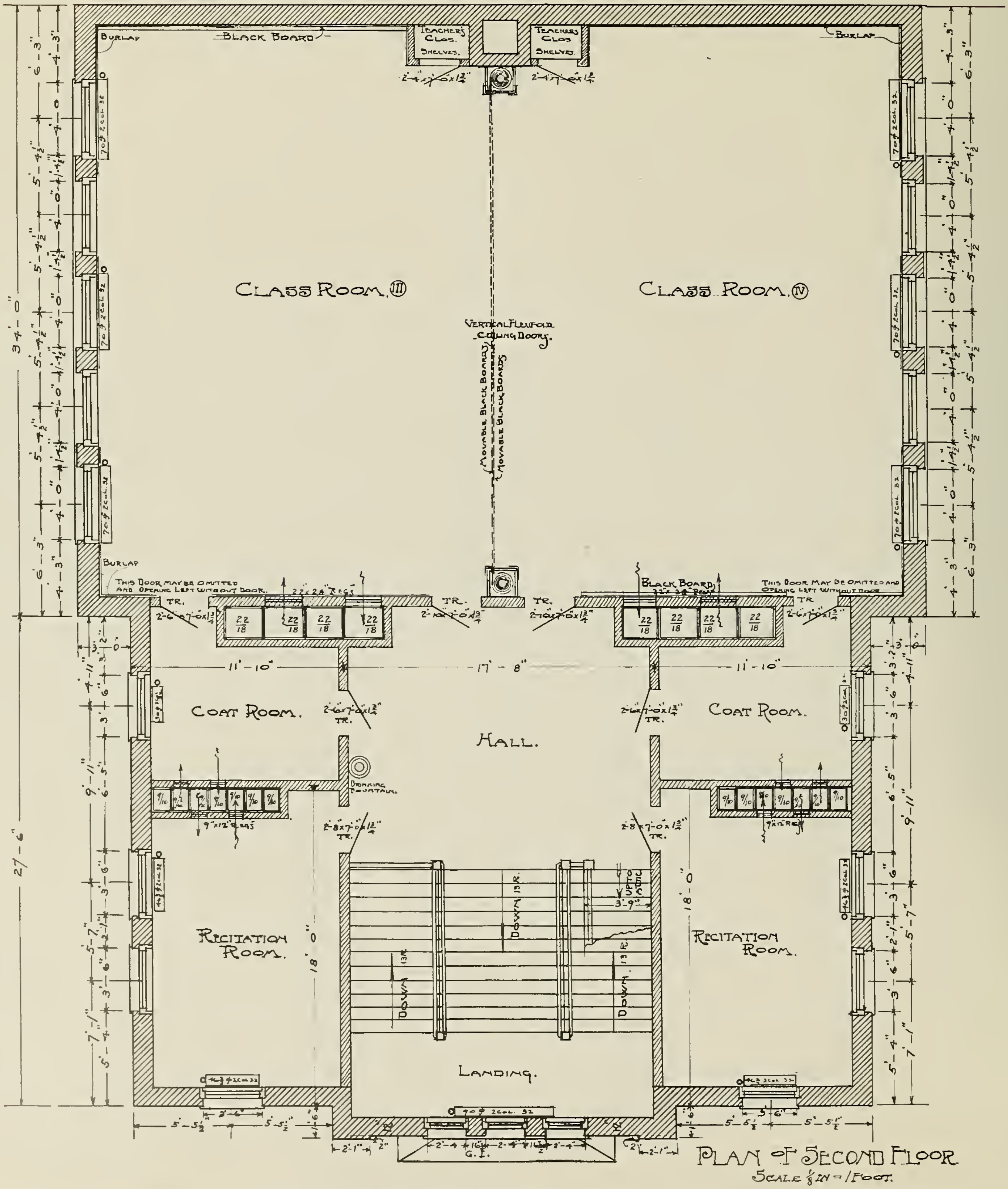
Basement Plan Four-Room Consolidated School Building

Design 7



First Floor Plan Four-Room
Consolidated School Building.

Design 7



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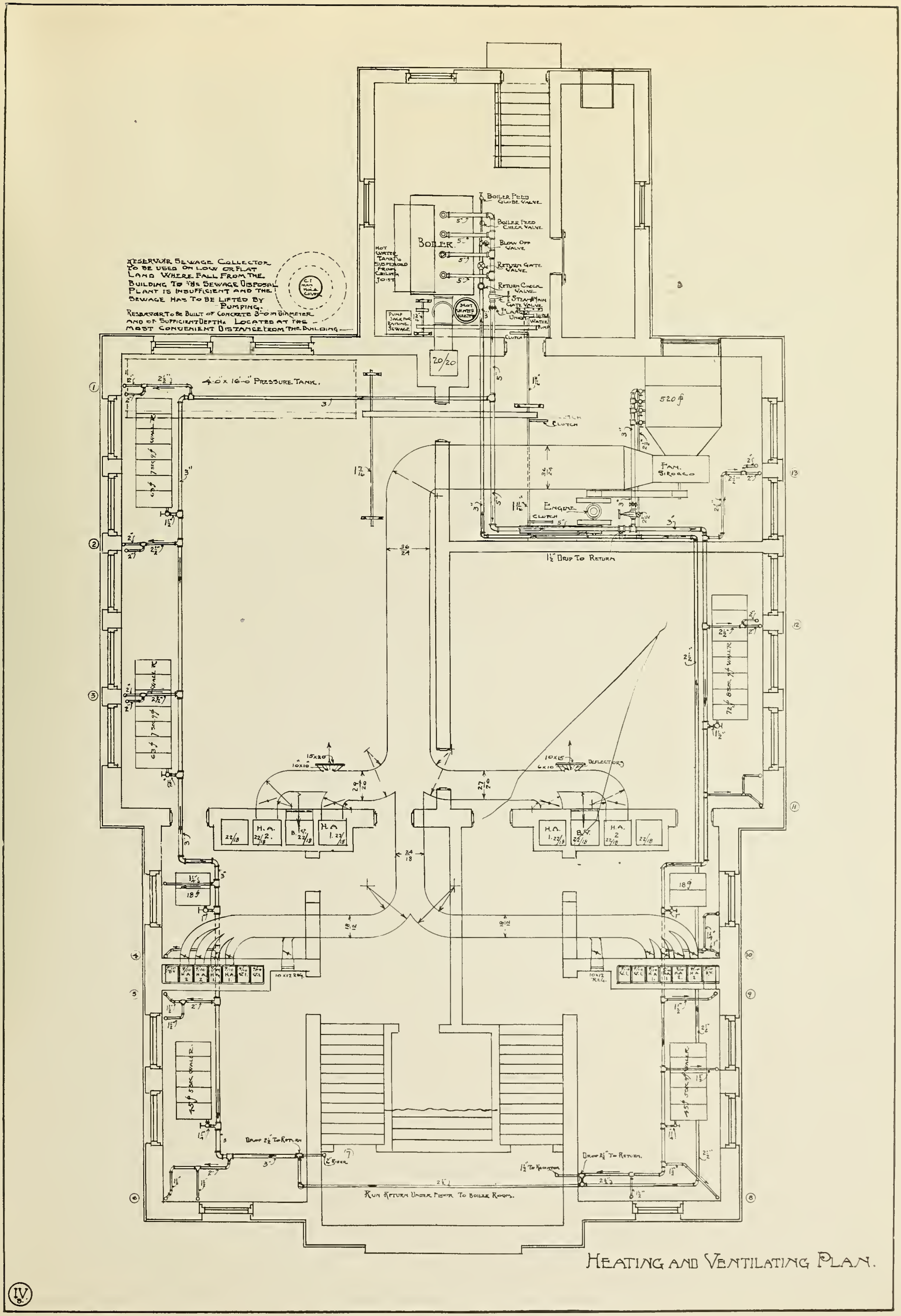
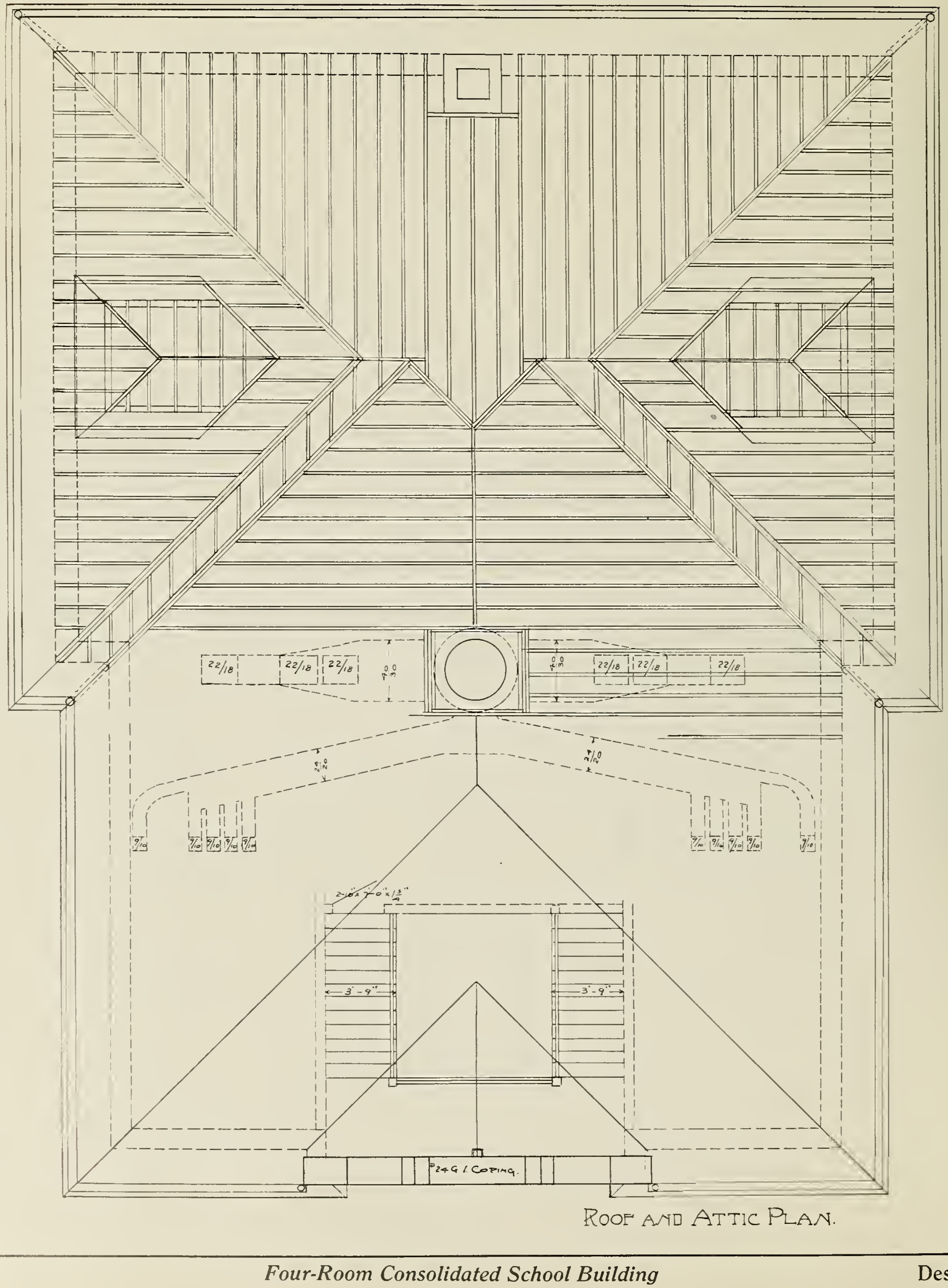
Second Floor Plan Four-Room Consolidated School Building

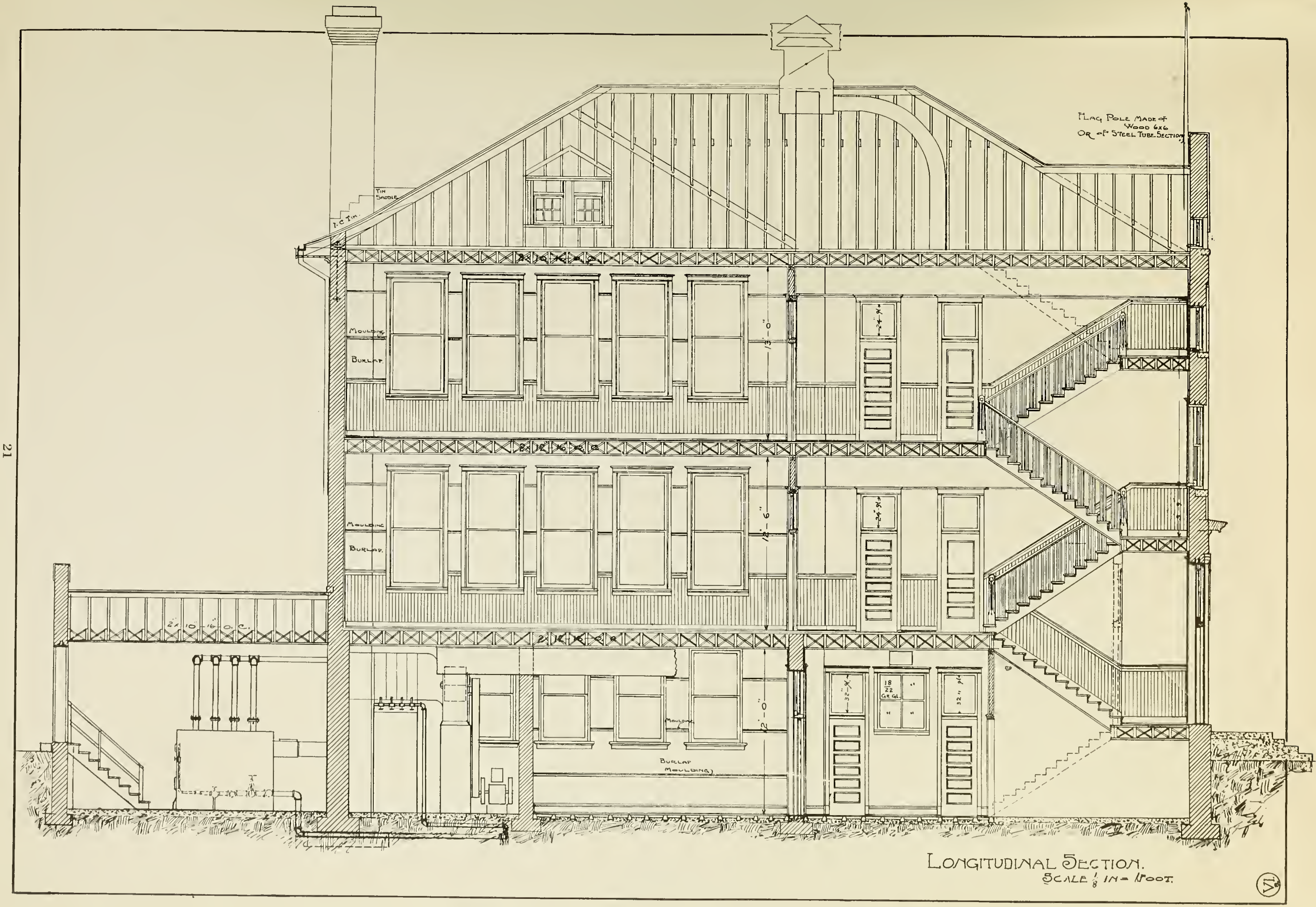
Design 7


Boiler Feed Globe Valve
Boiler Feed Check Valve
Blow Off Valve
Return Gate Valve
Return Check Valve
Steam Main Gate Valve
Flange Union
Boiler
Hot Water Tank Suspended From Ceiling Joist
Hot Water Heater
Pump Jack for Raising Sewage
Well Water Pump
Reservoir Sewage Collector To be used on low or flat land where fall from the building to the sewage disposal plant is insufficient and the sewage has to be lifted by pumping.
Reservoir to be built of concrete 3'-0" in diameter and of sufficient depth & located at the most convenient distance from the building
C.I. Man Hole Cover
Clutch
20/20
4'-0" x 16'-0" Pressure Tank.
520 ft
Fan Sirocco
Engine
1½" Drip To Return
Deflectors
H.A.
B.
Drop 2½" To Return
Run Return Under Floor To Boiler Room.
10 x 12 Reg.
Heating and Ventilating Plan.
IV

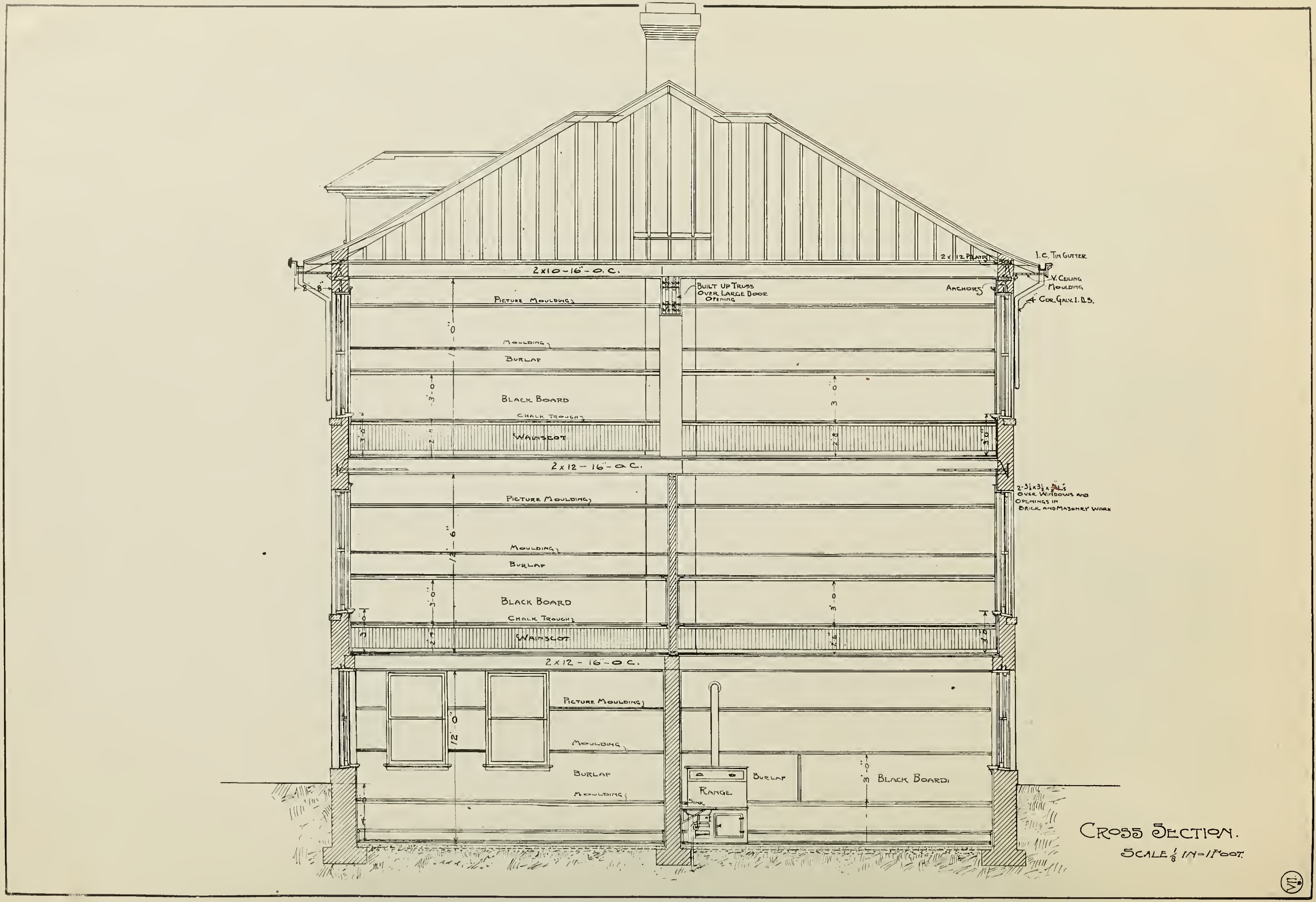
Heating and Ventilating Plan Four-Room Consolidated School Building. Design 7



ROOF AND ATTIC PLAN.

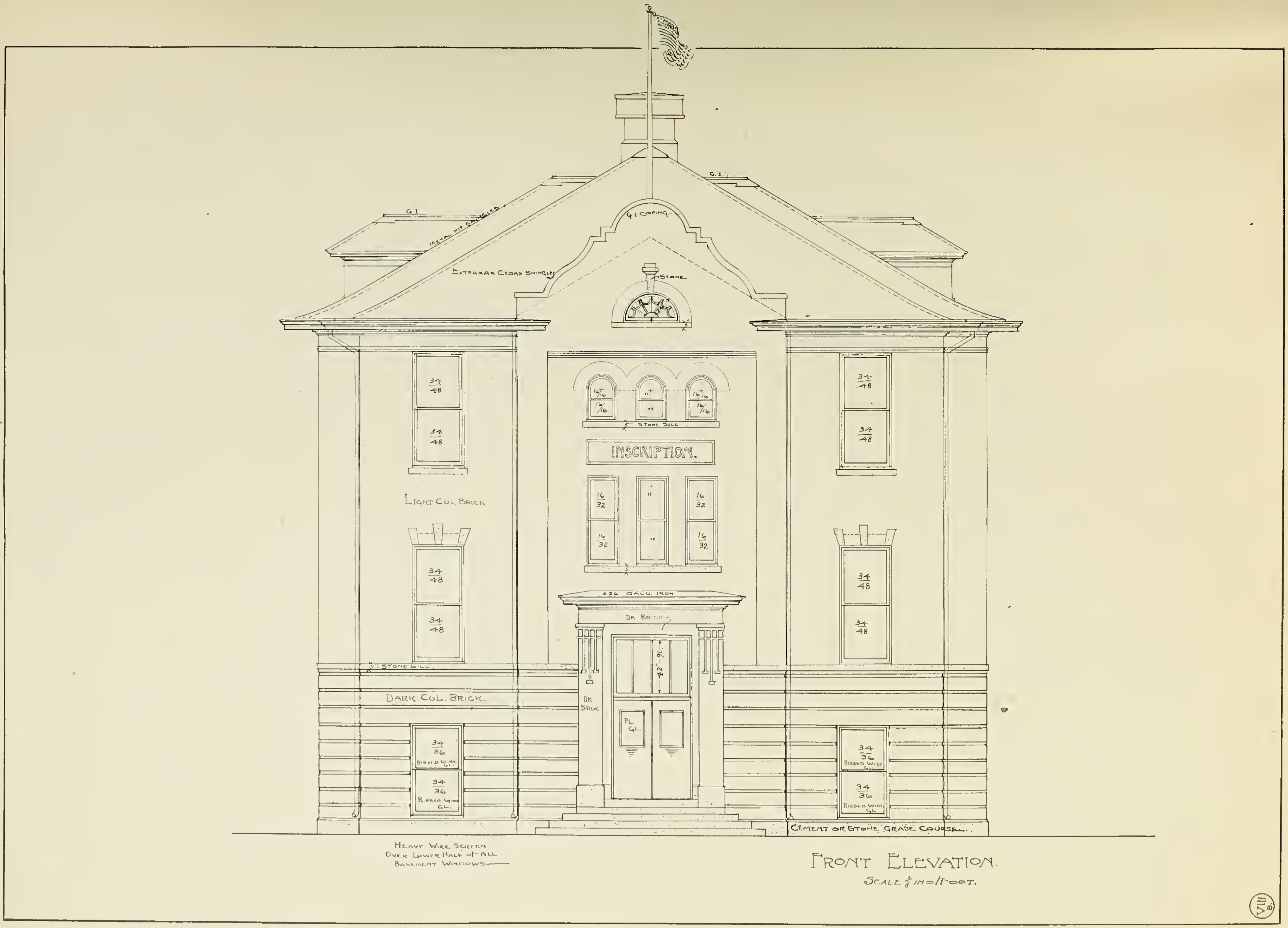


Longitudinal Section Four-Room Consolidated School Building.



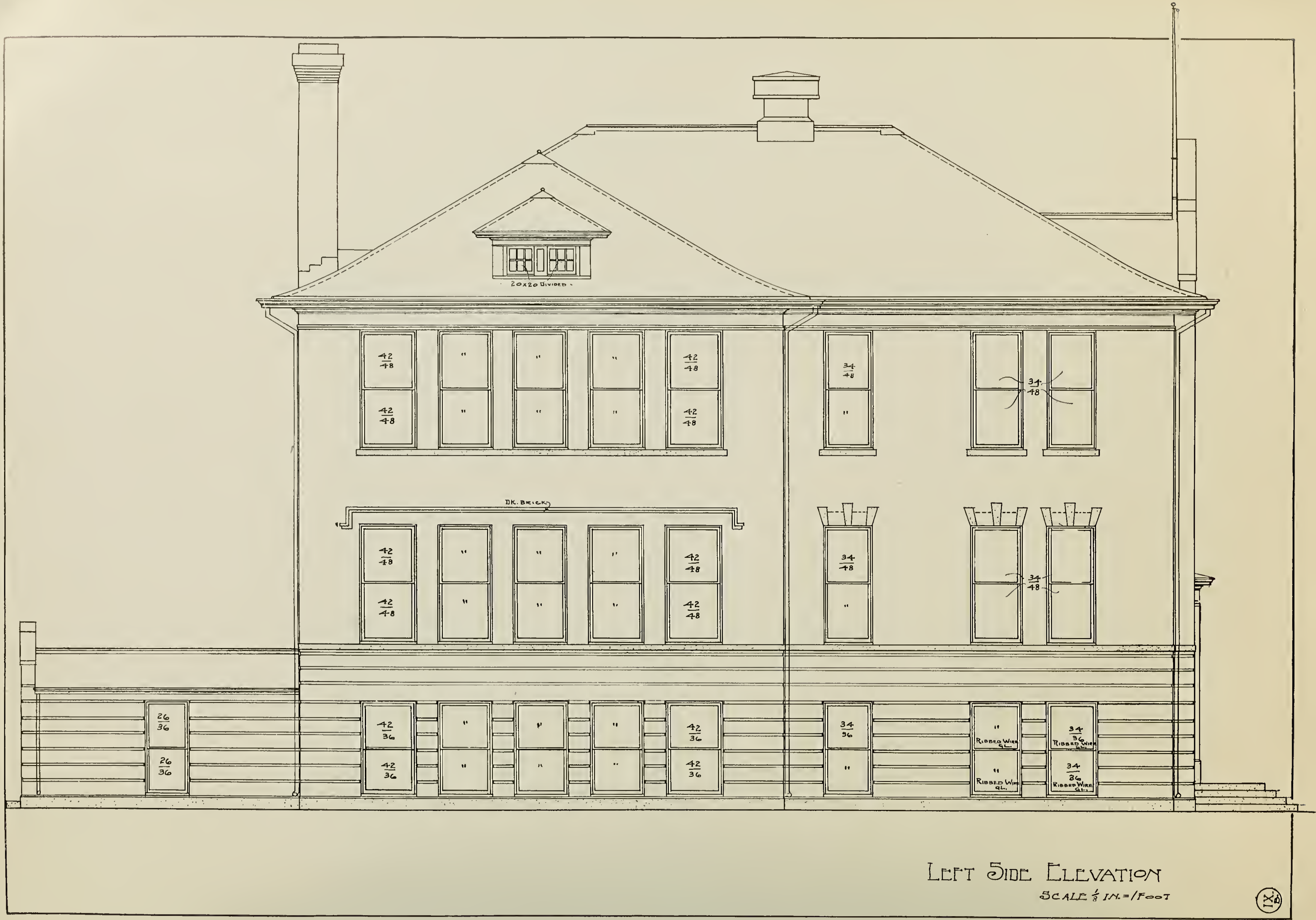
Cross Section Four-Room Consolidated School Building

Design 7



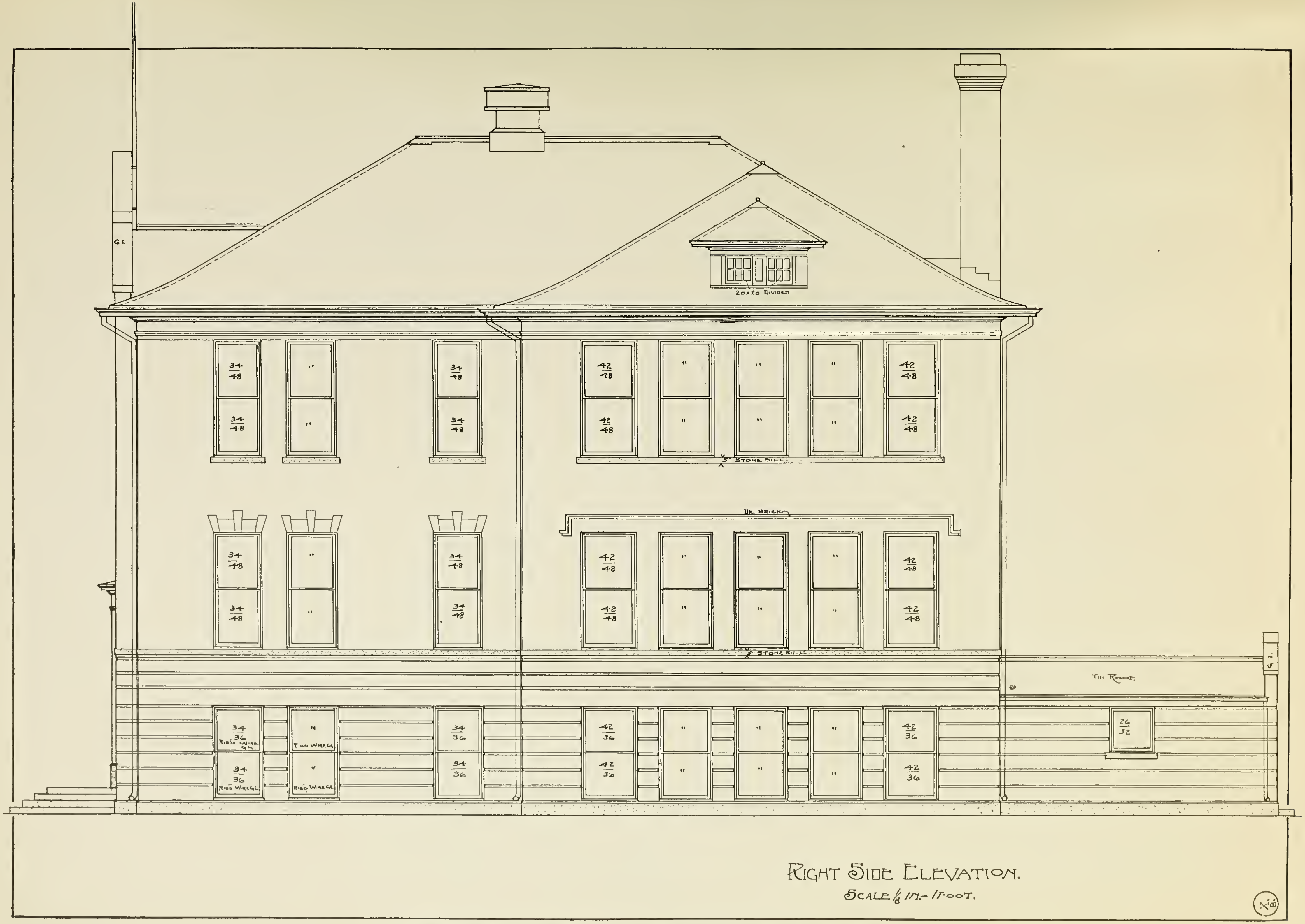
Front Elevation Four-Room Consolidated School Building.

Design 7



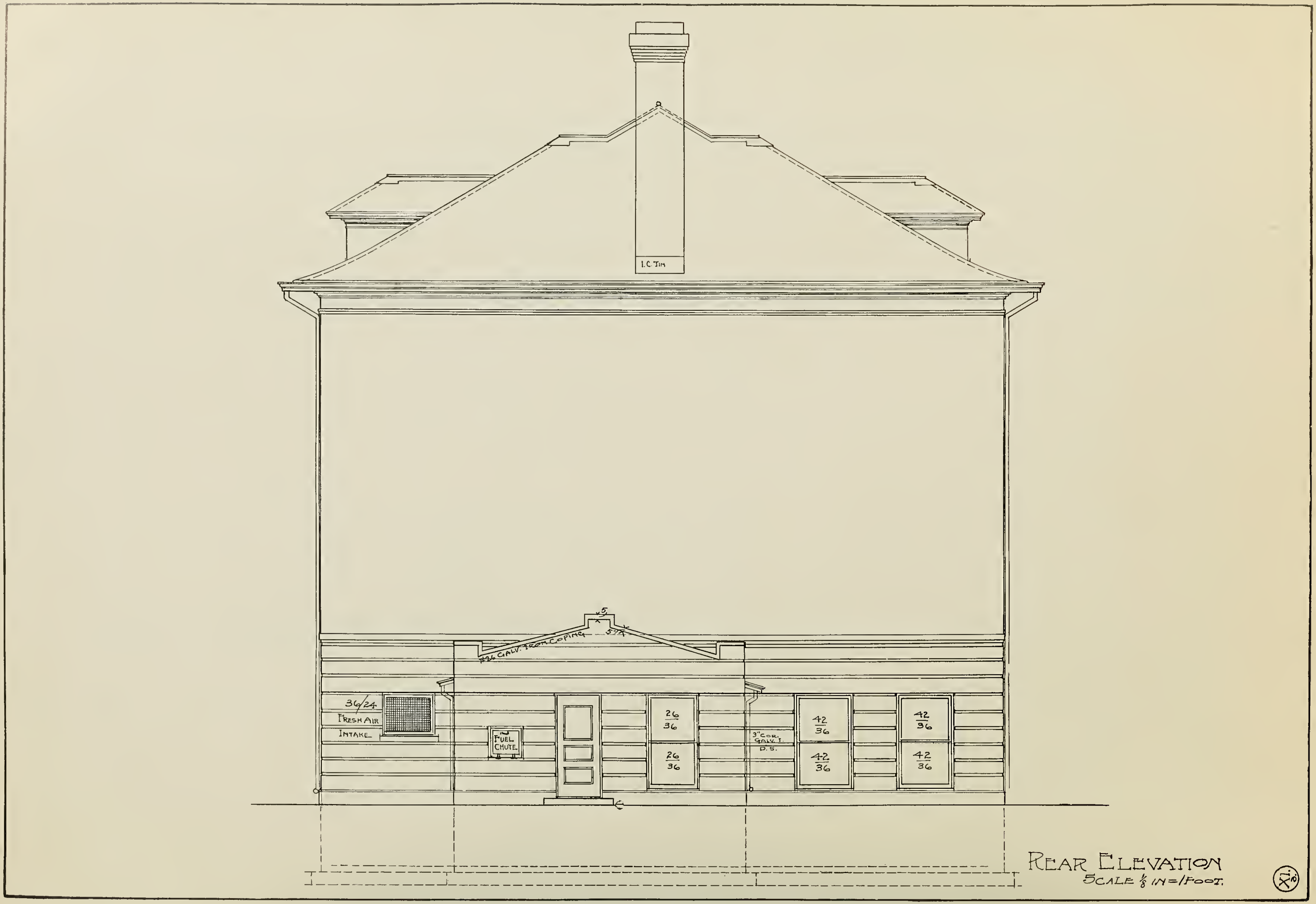
Left Side Elevation Four-Room Consolidated School Building.

Design 7



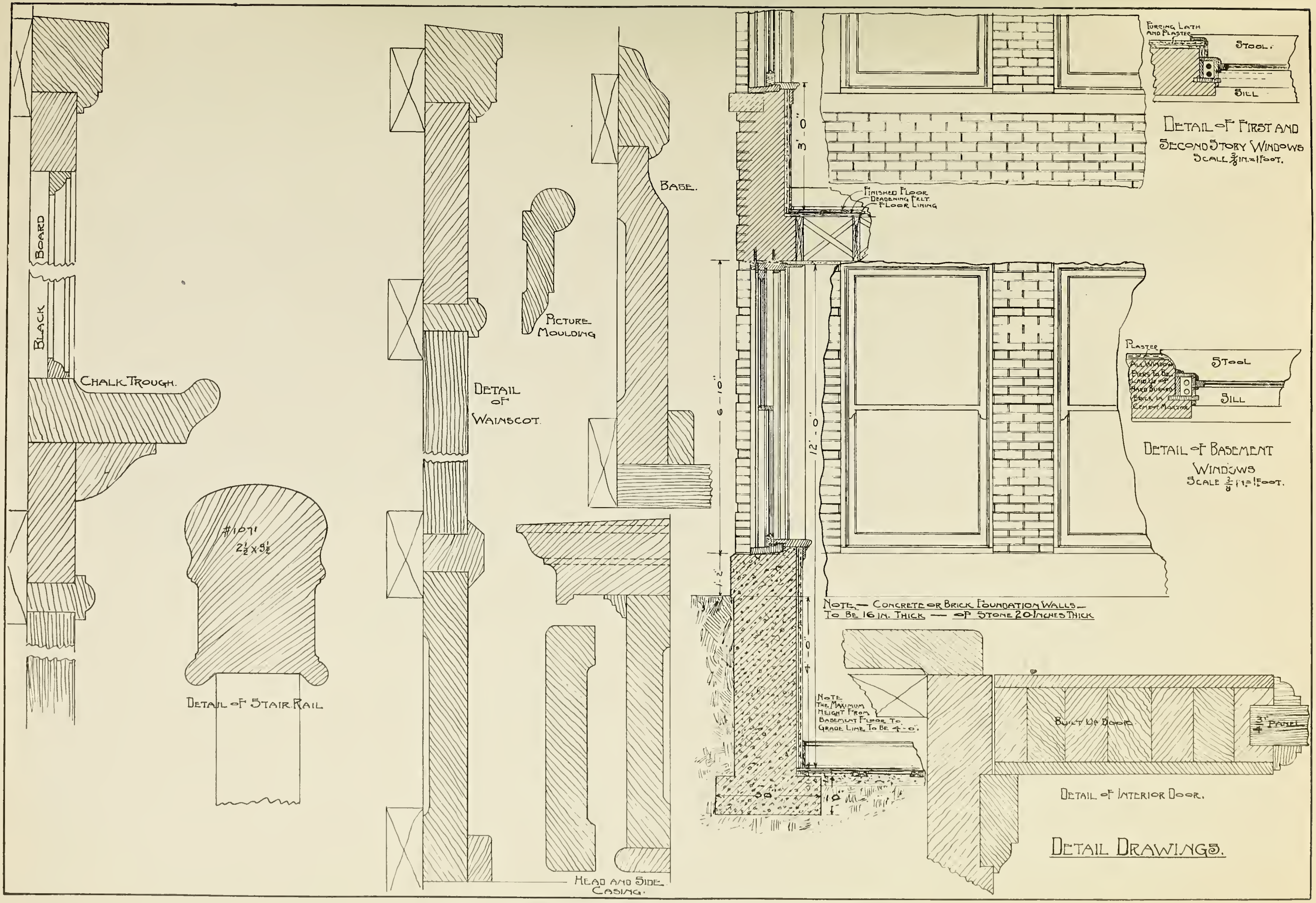
Right Side Elevation Four-Room Consolidated School Building

Design 7

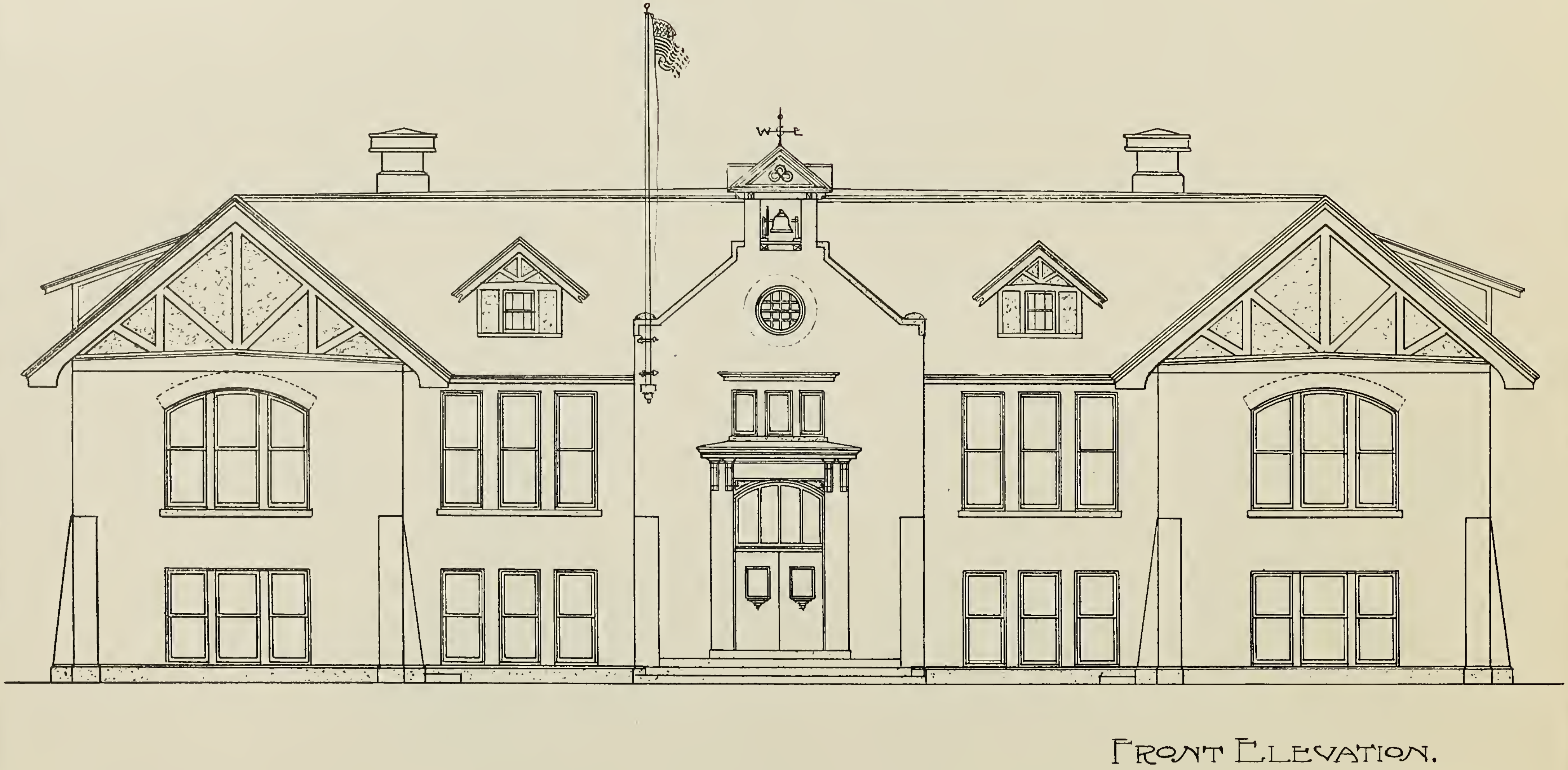


Rear Elevation Four-Room Consolidated School Building.

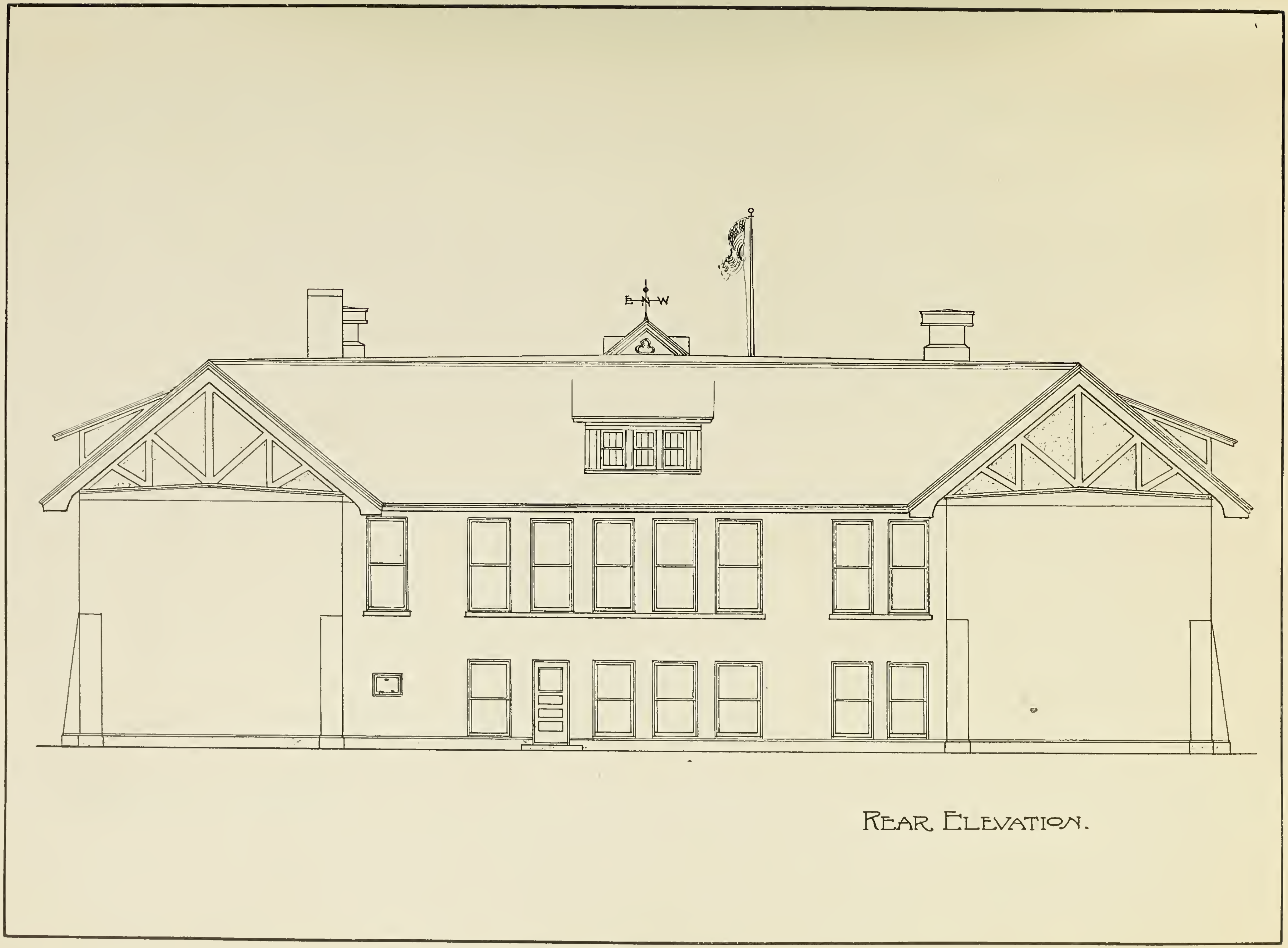
Design 7



Detail Drawings Four-Room Consolidated School Building

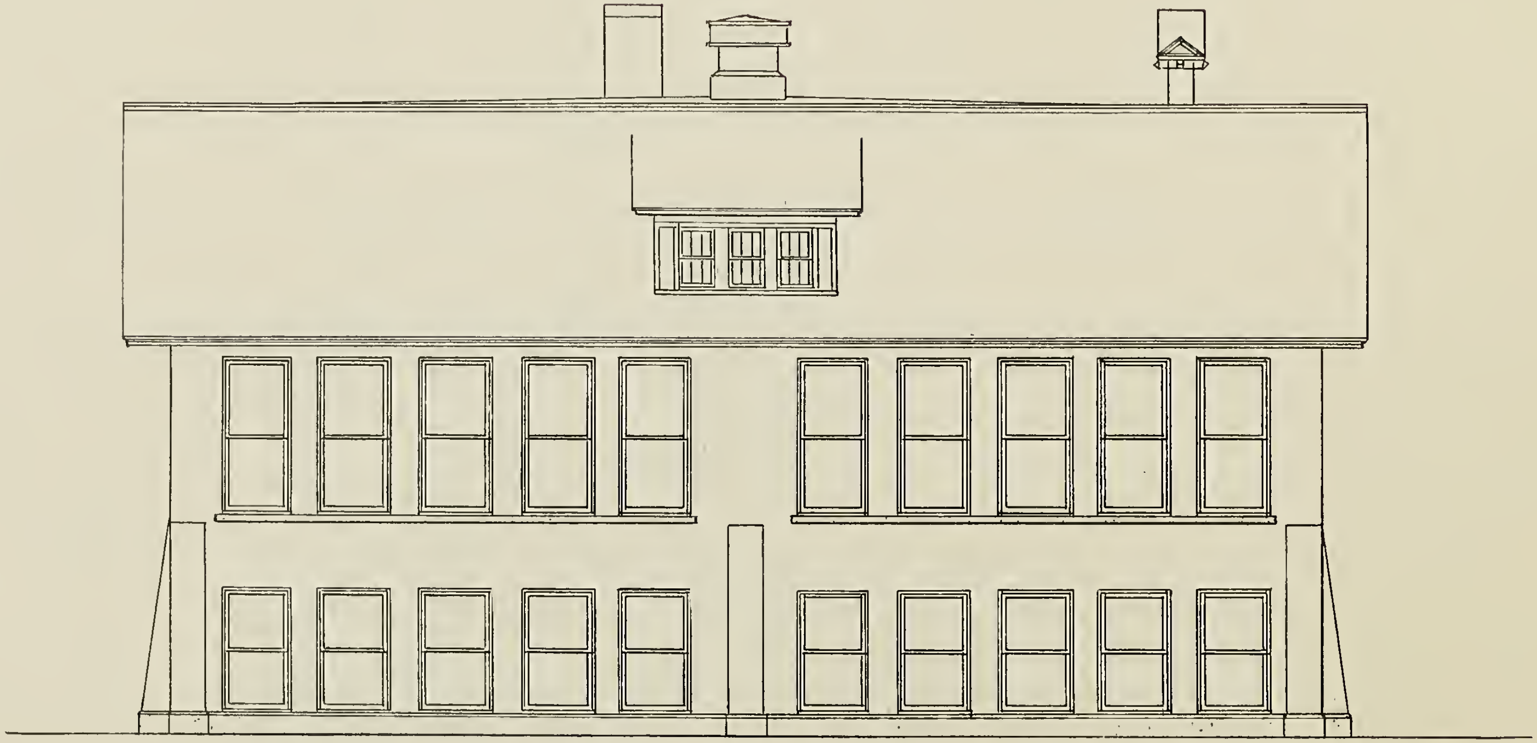


Design for a Four Class Room and Public Library, One Story and Basement Consolidated Rural School Design 8



Four-Room Consolidated School Building.

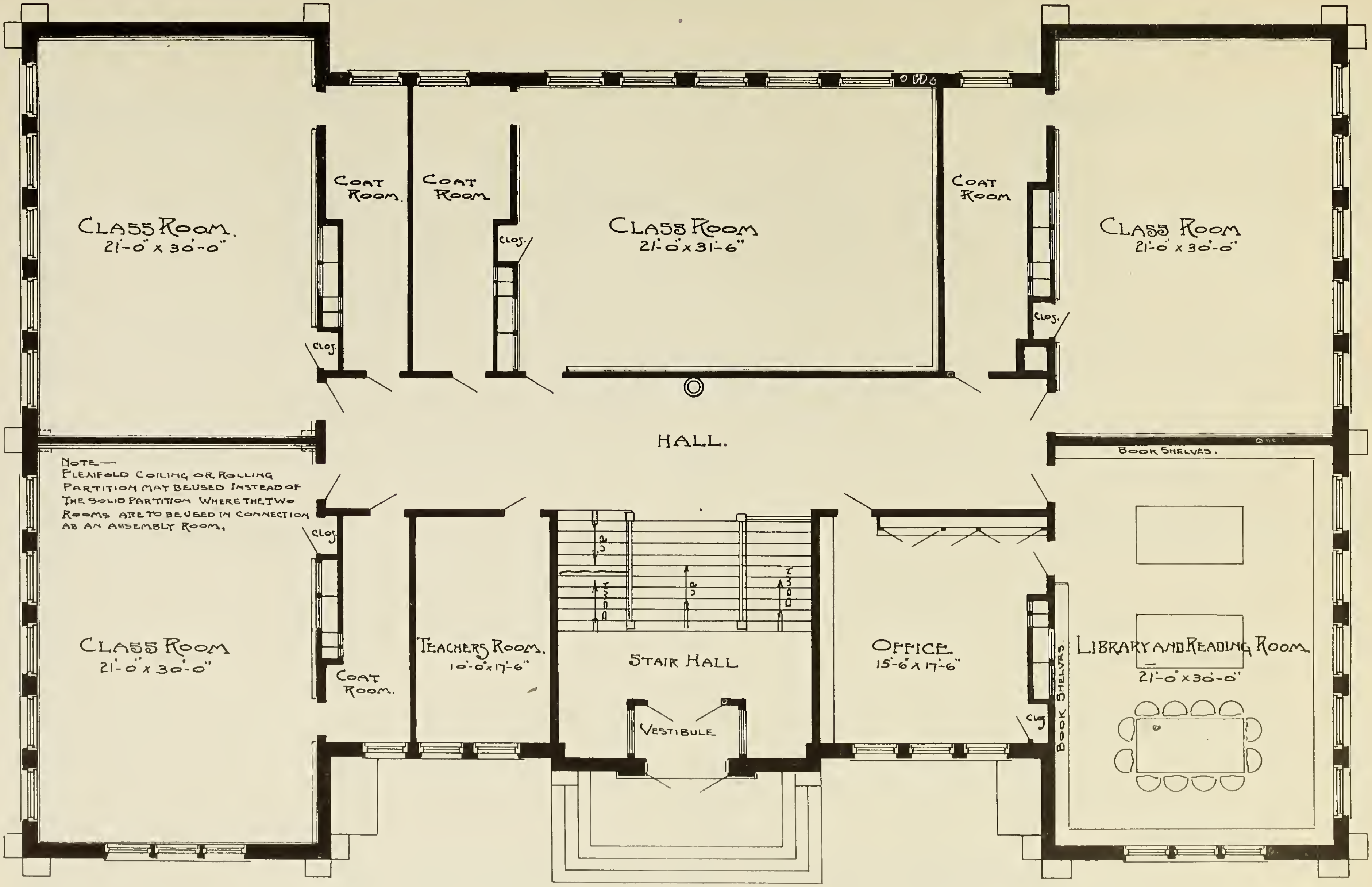
Design 8



SIDE ELEVATION.

Four-Room Consolidated School Building.

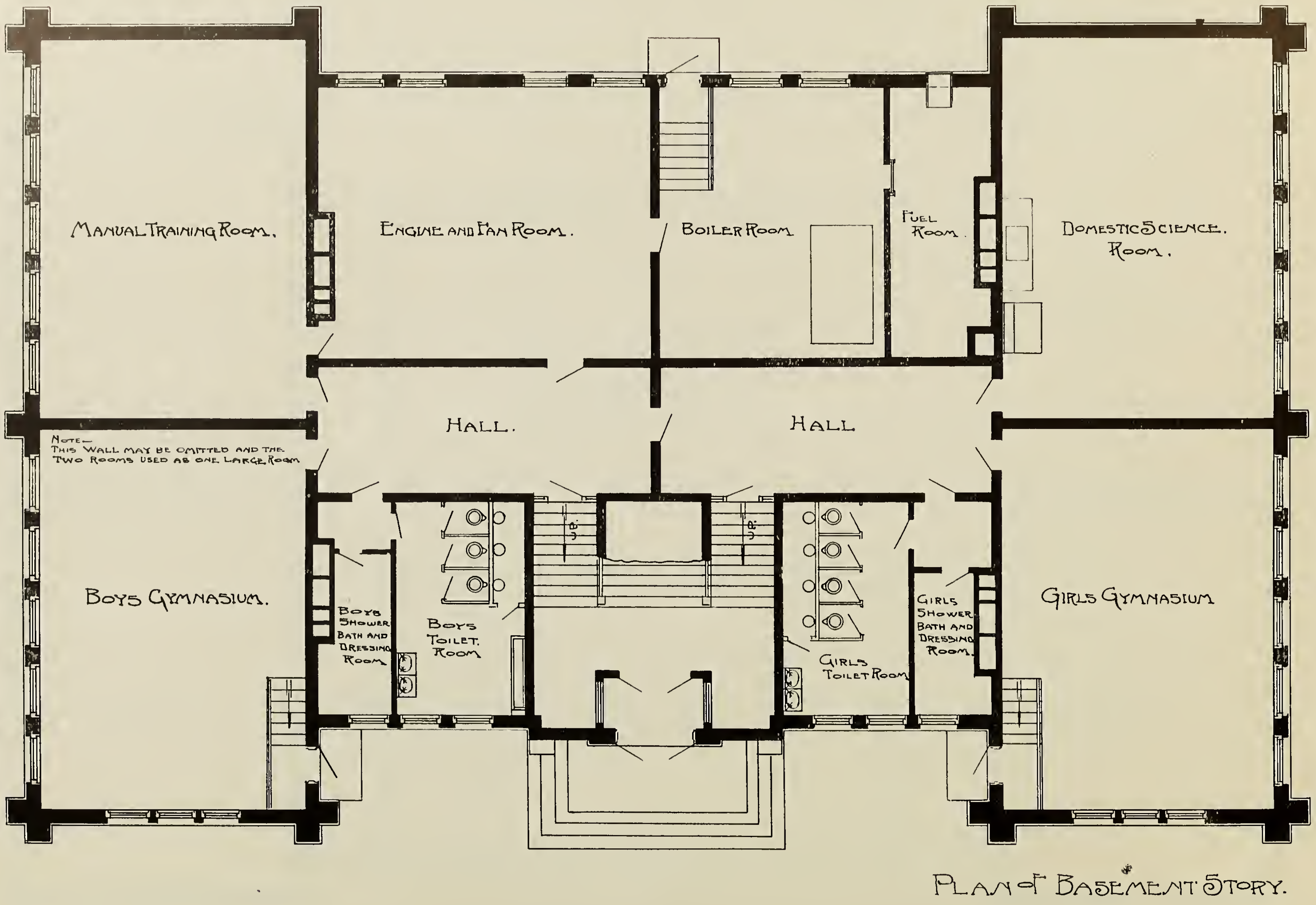
Design 8



FLOOR PLAN

DESIGN FOR A FOUR CLASS ROOM—
AND PUBLIC LIBRARY—
ONE STORY AND BASEMENT
CONSOLIDATED RURAL SCHOOL.

SCALE $\frac{3}{32}$ IN = 1 FOOT



Four-Room Consolidated School Building.

GENERAL SPECIFICATIONS

FOUR ROOM CONSOLIDATED SCHOOL BUILDINGS

GENERAL CONDITIONS

1. All materials furnished throughout this building of the several kinds and all workmanship performed must be in strict accordance with plans and specifications, detail and working drawings.

2. The Contractor will he held responsible to execute such work and furnish the very best material of the several kinds for the performance of this work.

3. All the work performed and the material furnished is to be subject to the inspection of the Superintendent and the Building Committee, and all the material and workmanship of whatever kind not in strict accordance with plans and specifications, will be rejected by the Building Committee or Superintendent and removed from the grounds within forty-eight working hours after his receiving written notice from the Superintendent, and should it be found by the Superintendent that any inferior material or workmanship has been used in the building, same shall be removed and the money paid for same shall be deducted from the next estimate after the rejection. And when said work or material has been replaced by the Contractor in accordance with the requirements of plans and specifications, then the sum deducted as aforementioned shall be due to the Contractor and paid with the next estimate.

4. The Contractor shall lay out his work and be responsible for its correctness and shall be required to give his personal attention and have a competent foreman on the work at all times, and he will be required to give all necessary lines, levels, patterns and dimensions according to the drawings and specifications and according to the Superintendent's instructions, drawings, etc. He will be held responsible to see that this work is correctly and properly carried out according to the true intent of plans and specifications and drawings. Contractor shall be held responsible to procure all needed instructions from the Superintendent for the progression of the work and explanation of drawings from time to time so as to be able to carry on the work in the most thorough and intelligent manner, so as to insure the best possible results in the construction of the building.

5. Should it become apparent to the Contractor or his foreman that an error was made in the drawings and specifications, then the Contractor must report such error at once to the Architect and such error will be at once rectified by the Architect and the plans returned to the Contractor.

6. Contractor will be held responsible for obtaining the necessary permits from the proper authorities, paying the required fees for same, and he must on completion of the work remove all waste material from school grounds, leaving the premises clean and free from any obstructions. He must also leave building clean on completion of same and in an undamaged condition in every particular.

7. Contractor shall furnish necessary ladders or needed facilities at any time so that the Superintendent or members of the Building Committee may have access to the work for inspection.

8. The Building Committee reserves the right to have access to the building while same is under course of construction, to enter the same for the purpose of installing heating, or any fixtures which they may wish to put into the building. By so doing, they in no manner accept any work or any part of the work that has been performed on the building by the contractor.

ESTIMATES

9. Estimates will be made from time to time, as may be decided in contract, by the Superintendent on all material and all labor that has been performed and all material that has been placed into the building, also material that is upon grounds at the time of making estimates.

10. The estimates shall be based on contract prices for the various classes of material and work furnished in construction of the building.

11. All payments will be made upon estimates after deducting 15%. Same to be reserved until the completion of the building and acceptance of same by the Building Committee.

12. The Contractor will be held to submit all bills or vouchers, etc., showing the quantity and quality of material as furnished, and render such other assistance to the Superintendent as he may demand to properly determine the quality of material and the amount of labor that has been performed, so that the Superintendent's estimates will be accurate and just to both parties concerned. Contractors will be required to furnish all necessary derricks, tackle, hoisting apparatus, etc., that are necessary to carry on the work in a manner that is satisfactory to the Owners and Superintendent. Before the completion and acceptance of the building as aforesaid, or the acceptance of any payment for any work or material on account thereof, the Contractor shall be required by the Building Committee to deliver full receipts and releases from all parties furnishing material or performing artisan or other work on the building while same is under course of construction on account of aforesaid building.

ESTIMATES AND RECEIPTS

13. When estimates are made by the Superintendent to the Contractor, the Contractor shall furnish an itemized statement as to the amount of labor used in the building or on the ground, the cost of same and the amount of money paid out for labor, etc., and the Contractor shall be held responsible for the correctness of same, and shall at all payments of money for work or materials execute a receipt in full to the date thereof, excepting only for the retained per cent as mutually agreed upon.

INSPECTION OF WORK

14. The inspection of the work and materials on payment made thereon shall not be construed as acceptance of such work or material but as money advanced thereon, until the final completion of the building and the acceptance of same by the Building Committee, nor shall the Contractor or his bondsmen be released from their responsibilities or obligations as hereon set forth or required by the contract.

15. Should any damage occur to any material or work while building is in course of construction, same shall be removed by the Contractor at his expense and perfect work and material replaced at the Contractor's expense. The Superintendent who has been engaged for the general supervision of the work is empowered to decide on the quality and quantity of all material and workmanship entering into the construction of aforesaid building and also upon the safety and security of the work. When in his opinion the latter is involved, he shall notify the Architect, who shall have the right to change and modify the construction so as to insure safety and durability.

ALTERATIONS OR CHANGES

16. It is distinctly understood that if there should be any changes or alterations made in the building requiring more material or work, same must be submitted to the Architect or Superintendent in writing, setting forth prices, etc., and if such changes are made, same to be made under a separate contract signed by the Building Committee and Contractor. Should such contract be made and entered into, it shall in no way change the original contract or lessen the responsibility of the Surety or Bond given by the Contractor. The Contractor will be required to obtain the consent of the Bondsmen in writing that such alterations and changes can be made without in any way invalidating the original bond as given for surety of the faithful performance of this contract, or for furnishing suitable materials and workmanship such as is required by plans and drawings.

QUALITY OF WORK

17. It is the perfect understanding by both parties that the Building Committee is contracting for the erection of this school building with the Contractor, that all material shall be first class in every respect, and that the different kinds of work performed on this building heretofore mentioned shall be performed in the most substantial and workmanlike manner by the best skilled mechanics, which shall be a basis of a decision should any trouble arise as to workmanship and material used in the construction of this school building.

EXPLANATIONS OF PLANS AND SPECIFICATIONS

18. Should any dispute arise as to any technical words or phrases used in the specifications, or any question as to the requirements of drawings, then the Superintendent or Contractor shall refer to the Architect and his decision shall be binding and decisive as to the meaning and requirements of plans and specifications.

BOARD AND BUILDING COMMITTEE

19. The Board or Building Committee reserves the right to reject any or all proposals for bids and to accept only the bidder who in their judgment is best qualified to carry out the contract for the building in the most satisfactory manner, so as to insure a first class and satisfactory building in every manner. The Building Committee will in no way become responsible for any personal damage which may occur while this building is under course of construction, but the Contractor or Contractors must make his or their own calculations to pay for all personal injury claims caused by his negligence or otherwise, look after the proper safety of his men while working upon this building while same is under course of construction.

GUARANTEE

20. Be it also understood by the Contractor or Contractors that they will be required to furnish a bond running eighteen months from date of completion of said building guaranteeing against any leaks in roof, or other defects. Then bondsmen are to be released from any further liabilities and bond to be cancelled or surrendered by the Board of the Building Committee to the Contractor or his bondsmen. The bond is to be for $250.00, and should the Contractor fail within five days after being notified of leak in roof to take proper steps to stop leak, then the Board may take such action as they deem necessary to make roof tight or correct other defects, and all expense of same shall be paid by Contractor or his bondsmen. Contractor is to be held responsible for any damages to the inside of building caused from leaks or imperfect work on roof and he or his bondsmen are to make same good at their expense, or pay for same, that is when work has been performed or made right and all leaks or defects in roof made good.

21. The Owner shall maintain full fire insurance on the building at all times.

22. Location and level of building to be established by Owners and Owners pay all fees for same.

PLANS AND SPECIFICATIONS

23. These plans and specifications are intended to co-operate in every particular. The specifications are to be considered by the Contractor as the explanatory part of the plans and any part of the work specified in specifications and not shown on drawings is to be performed the same as if shown on both, or vice versa.

MASON'S SPECIFICATIONS

EXCAVATION: The lines and levels to be furnished by owner. Clear away all rock, dirt and rubbish. Excavate for the basement, for all footings, for walls, piers, chimneys, drains, etc. Excavate at least one foot larger than the outside line for all walls and to the full depth. Do all necessary excavation required so as to carry out the work as specified and shown on drawings.

All earth or rock from the excavation not required for falling in or grading, is to be removed from the premises, otherwise all left at some suitable place on the ground. Grading to be done by Contractor.

Fill earth around the walls, piers, drains, etc. The filling after the mortar is dry. All filling to be well rammed, and the earth sloped away on all sides from the walls of the building.

FOUNDATION WORK

FOOTINGS: Put under all walls, chimney, steps, etc., as indicated on plans, concrete footings. Concrete to be composed of one part good Portland cement, three parts clean gravel, and three parts clean sand, by measure, well mixed and properly tamped solid. Footing to be 8″ on both sides of walls. Chimney footings to be 12″ thick.

CONCRETE FOUNDATION: In case foundation walls are built of concrete, the walls are to be of sizes and forms shown on plans and details for concrete foundation. Walls to be thickness indicated on plans, and of concrete composed of one part high grade Portland cement, three parts clean gravel and three parts clean sand by measure, well mixed and poured into forms and well tamped. Build walls level on top to receive joists and beam fil to top of joists.

STONE FOUNDATION: Build walls and piers of good, sound rubble stone laid in Bricklayer's cement mortar, mixed in proper proportions with clean, sharp sand and clean water.

Rubble walls to be 18″ thick laid to a line on both sides, the joints and interstices in the walls to be well filled with spalls and mortar and all joints, weather pointed inside and below grade outside with good mortar.

Thoroughly bond all walls and build in window frames. Build walls level on top to receive joists and beamfill between to top of joists.

COAL CHUTES: Put in cast iron coal chute where shown on plan. See basement plans.

CUT STONE WORK: The trimming stone for building to be of Bedford, Kasota or Kettle River Sand Stone. All stone to be laid in their natural beds.

All stone work must be laid straight, plumb and true and the work executed in a thorough, workmanlike manner. All face stone work must be neatly pointed at completion of building. For details of stone work, see plans and sections.

IRON WORK: Make ample allowance for anchoring second story floor and ceiling joists every six feet. Use bolt anchors ⅜″x1½″x3 ft. long with ¾″ bolts.

Provide 3½″x3½″x⅜″ steel angles for all doors, windows and other openings in brick work.

Wrought iron stirrups for all headers.

Provide iron thresholds for outside entrance doors.

Flag pole of steel tubing sections. Same to be carefully erected and flashed around base to make water tight.

TIN: Flash around coping, walls, chimneys, etc., and lay in tin to guard against leakage. Galvanized iron cornices for entrances as shown. For down spouts, use No. 24 Galv. iron.

All tin used in this building for hips, valleys, etc., shall be I. C. tin, equal to Scott's Extra Coated or Taylor's Old Style brand. One coat of red lead iron oxide or Venetian red paint with pure linseed oil shall be applied to underside of the tin before laying.

Tin roof over engine and boiler room is to be laid standing seam 20x28 inch sheets, courses applied the narrow way, the 20″ ends to be locked with ½″ seams carefully soldered. The 20″ courses are to be locked with double standing seam and secured to sheathing with cleats every 8″, using two 1″ roofing nails to each cleat. The edges shall be turned up 1¼″ and 1½″, the standing seam to be 1″ high when complete. Tin to be laid on water proof paper. Tar paper and other paper containing acids are prohibited.

Flashings to be let into the joints of the brick work and cemented. Counter flashings shall be kept 3″ from lower edge of sheet to the roof. Solder to be of best grade bearing manufacturer's name and guaranteed. Use rosin only as a flux.

BRICKWORK: Use best, sound, hardburned brick throughout. All brick to be laid up in the best and most workmanlike manner. Brickwork to be well bedded, flushed up and tied every seventh course, all set up in regular bond, pointed close to sills and projections. Bed solid all door and window frames. Point up under sills with suitable mortar after walls are up. All brickwork must be made perfectly level and straight to the proper and exact height. Provide all needful material of every description. Protect walls from weather at all times.

The mortar to be composed of clean, sharp sand free from loam or alkali, and Bricklayer's cement in proportion as directed by manufacturers, or lime or lime and cement mortar. All water to be furnished by Contractor and paid for by him, and must be clean.

FACING BRICK: Brick work from grade course to belt course of first story windows to be faced with darker pressed brick at about $22.00 per M. Pressed brick to be laid up in not over 3/16″ colored mortar joints, color of mortar to be selected by Building Committee.

Face brick of upper part of building from first story belt course to be of carefully selected, common, uniform colored brick to be laid up in ¼″ spread mortar joints, color of mortar to be selected by Building Committee; or of lighter colored pressed brick at about $20.00 per M. laid as described for darker colored brick.

Take special care to keep walls clean. Joints are to be neatly trowel struck. Outside walls to be plumb and true and neatly cleaned on completion of building.

BEAM FILLING: Do all needed brickwork filling between beams or joists for all parts in the construction throughout.

CHIMNEY: The chimney to be built where shown on plans to admit of setting boilers where shown. The walls around flue to be 9″ thick and are to be plastered smooth on inside. Provide for necessary flue and cleanout openings.

Put in all necessary flashings around chimney to insure water tight job. Chimney to be faced with the same brick as used for facing up the building and finished with 6″ thick stone cap.

FURRING: Outside walls are to be furred with 1″x2″ furring strips set 16″ on centers, set straight and true.

LATHING: Lath wood partitions and furred walls throughout building, also all ceilings, with a good seasoned pine lath, except ceilings of basement rooms, which are to be lathed with ⅜″ Sacket Plaster Board or equal. Pantry in basement is to be lathed with expanded metal lath to make room mouse proof. Lath must be free from shakes and black knots. Break joints evenly every seventh course and nail same with 3d common wire nails.

No lath to run through partitions from one room to the other. Lath to be laid not over ⅜″ apart. This includes all ceilings in and around all stairways, class rooms, toilet rooms, halls of basement, etc.

GROUNDS: Put in grounds where necessary, around all door and window openings, bases and along sides of stairs to receive inside finish. Same are to be perfectly level, straight and true to receive plastering and to be ¾″ thick.

PLASTERING: Building is to be plastered throughout with Ivory Wood Fibre Plaster or equal, on all lath work and also on all concrete or brickwork walls in basement. Fibre should be soaked in water tight box for fifteen minutes, then work up the mixture in the usual manner, adding sufficient water to bring it to the proper consistency. Apply same as any hard wall plaster. Use rod and darby, then finish with a float finish.

Do not drench this work with water, use damp brush. Do not attempt to float after material has set. All dry lath are to be well drenched before applying plaster. Hard finish or white coat to be a sand finish coat.

Care must be taken that all walls and angles are made straight, plumb and true and rolled to a true and even surface. The walls must be floated down in first-class and workmanlike manner to make complete work and entirely satisfactory to the Superintendent and Building Committee.

CARPENTER'S SPECIFICATIONS

All dimension lumber throughout the several apartments of this building for the construction of floors, roofs and ceiling joists are to be in size as shown on plans, sections and drawings. All dimension is to be good, sound, seasoned pine lumber. Floor joists are to be sized and crowned ¾″ from center each way. All framing throughout is to be thoroughly performed, each and every part well and securely braced as shown by sectional drawings and details. The floor and ceiling joists to be spaced 16″ on centers as indicated on plans, well supported on walls as shown by the different drawings and sections. All joists that have over 20 ft. span are to have three rows of 2″x2″ bridging securely spiked and nicely fitted in place and well nailed. Studdings used throughout building are to be 2″x6″. Same are to be sized to uniform width, and partitions are to have double carrying plates at the top and bottom of partitions. Partitions are to be well and securely anchored to the brick work at intersections. Truss over all doors and large openings, also double studding around same. Put in one row of 2″x2″ herring bone bridging in the center of each partition, same to be thoroughly spiked and fitted in place. Double floor joists under partitions. Put in double trimmers around all openings and floors for stairways, chimney, etc., also double carrying joists, and same are to be thoroughly framed and at intersections use heavy wrought iron stirrups ⅛″ thick and 2″ wide for hanging trimmers so as to insure substantial piece of work.

TRUSSES: Trusses over large opening for coiling doors on second floor to be built up in the best and strongest manner as shown in sectional drawing.

Rafters are to be 2″x6″x16″ on centers, excepting the hip and valley rafters which are to be doubled 2″x12″. All joinings of rafters to be neatly fitted, well and thoroughly nailed in place.

PLATE: Put plate of 2″x12″ around building on brickwork, same to be bolted down to masonry by using drift bolts 2 ft. long, set 7 ft. on centers with large head set in brick work and with butt and washer to screw down close to plank to hold same securely to brickwork. Extra care must be taken to make all framing strong to support any load which may be thrown on same without any settling whatever.

FLOOR LINING AND ROOF BOARDS: Lay floor linings throughout using No. 3 common boards. Same are to be surfaced one side and as dry as can be secured in the market. The floor linings are to be laid diagonal on floor joists. Securely nail same to floor joists.

Roof boards are to be No. 3 D. & M. well drove together and nailed at each bearing with 8d common nails.

DEADENING FELT: All floors shall be deadened with H. W. Johns, or as good, Extra Heavy Keystone Hair Felt Deadening. First, lay one layer directly over the subfloor, bringing same up on all side walls at least 6″. Over this lay 1″x2″ furring strips 16″ O. C., only nailing sufficiently to hold strips in place while laying finished floor. Nails used in laying finished floor should not penetrate the felt.

DOWN SPOUTS: Put up where shown on plans 6″ down spouts. They are to be made of No. 24 galv. iron, corrugated and securely fastened to brickwork with wrought iron brackets.

ROOFING FELT: Roof is to be covered with the best roofing felt, stretched and lapped at least 2″.

ROOF: Roof to be shingled with Extra Star A Star cedar shingles laid 4½″ to the weather. Split all shingles over 8″ wide before nailing. Use galv. 3d nails.

WINDOW FRAMES: Build window frames using good, dry, seasoned white pine lumber. Frames to have staff bead to receive brick facing.

DOOR FRAMES: Door frames are to be made as per plans and details. Outside door jambs are to be rabbeted to receive doors and must be properly set, plumb and true.

INSIDE FINISH: Inside finish to be white or red oak and made as shown on detail drawings. Basement story to be pine finish.

STAIRS: To be of even shade oak finish, house stringers to be ⅞″ finish. All H. maple treads 1⅛″, tongued and grooved, for risers ⅞″ tongued and grooved. Half round nosing for all treads, ⅝″ moulding under all nosings. Wall stringers to be finished to fit base, base mould on stringers with base on landings, base mould and ¼ round. Stairs to be housed, glued and wedged up and to have three center carrying stringers. All stair work to be done in first class manner.

Hand rails to be provided for all stairs.

WINDOWS: All the windows throughout the building are to be in accordance with the dimensions shown on elevations. All glass to be "AA" double strength, well bedded, bradded and puttied.

Jambs to be ⅞″, blind stops for large windows 1⅛″. All made and erected in best manner. Sash of windows to be hung to carefully adjusted C. I. balance weights with Silver Lake or Sampson Spot sash cord over steel pulleys. All window sash to be 1¾″ thick and to be oiled or primed from mill. Transom sash to be same thickness as doors. Transom over interior doors where shown on plans. All to be glazed with D. S. glass and to be hung at bottom and provided with good transom lifts.

All glass must be whole at the completion of the building. Any broken glass must be replaced and made good by the Contractor.

All windows to be provided with sash locks and lifts of real bronze.

Storm sash to be provided for all windows, to be 1⅛″ thick, glazed with best S. S. glass, divided into four lights. All storm sash to be hung on convenient storm sash hangers and provided with proper fasteners.

DOORS: The entrance doors, as shown on plans.

All interior doors are to be made as shown on plans and sections, and all glazed doors, where marked, to be D. S. ground glass.

FINISH (Inside): Doors, windows, casings, railings, etc., in the several rooms of the building to be in form, style and dimension as shown on details and drawings, and all casings, base, etc., to lap at least ¾″ over all grounds and same must fit perfectly to plastering. Wainscot to be made as shown on plans. Put in place protection on all exposed angles throughout entire building. Also furnish and set rubber tipped door stops for all inside doors. Doors to pantry in basement to be protected with good galvanized iron at bottom and to come up 4″ on both sides to make them rat proof.

LIBRARY BOOK CASES AND SHELVING: Bookcases for library as shown on plans, to have counter shelves same height as window stools and to have drawers, cupboards, and shelves below, and book shelves above counter shelf.

SHELVING: Provide open shelves, having all books in view and within reach. Shelving should be built around the walls, and under the windows. Shelving should be built standard height, which is about 7 feet 2 inches, allowing a 6-inch base, 6 shelves one inch thick, with 10 inches space between and a 12-inch space for the bottom shelf to accommodate large-sized books. Shelves should be 8 inches deep, and not more than 36 inches long, as they will sag if too long.

FINISH FLOORS: Lay finish floors over entire first and second floors, class rooms and halls, also in pantry, class rooms and halls in basement.

The finish floors to be No. 1, IXL Maple Flooring. Same to be 2½″ wide, tongued, grooved and ends matched, ⅞″ thick. To be well nailed at bearings with 8d wire finish nails. Finish floors to be scraped down and made smooth and even.

Tile floors in Vestibules to be figured at 60 cents per foot in place.

CEMENT FLOORS: The boiler, fuel, storage and toilet rooms to have cement floors. Same to be solid, smooth and level and laid on a 3″ concrete base composed of one part high grade Portland cement and four parts course gravel and two parts sand. Then trowel on a facing coat using one part Portland cement and one part sharp sand. This coat to be ¾″ thick. In concrete base under sleepers in basement pantry, fine meshed expanded metal lath is to be bedded into the concrete in order to prevent entrance of rats or mice.

COAT ROOMS: Coat rooms to have 4½″ plain hook strips on all sides. Coat rooms are also to have wire screen clothes racks in center. Hook strips and racks to be provided with sufficient number of japanned wire coat and hat hangers.

BLACKBOARDS: The walls of class rooms, except where interrupted by doors and windows, to be provided with best slate blackboards carefully erected, joined and smoothed. All slate to be first quality and free from flinty substances.

BURLAP WINDOW SCREENS: Furnish, fit and hang full sized screens for all class room windows. Same to be hung on same hangers as storm sash. All wood work of sound, clear, white pine, fitted with good galv. black or galv. wire screen nailed on with staples and astragals—cross mullion level with check rail of windows. All screens to be painted in three coat work.

HARDWARE: All spikes, nails, screws, bolts, etc., to be of suitable sizes for the different parts of the work, and to be furnished by the Contractor.

INTERIOR HARDWARE: The Contractor is to set aside the sum of one hundred dollars ($100) and include same in his bid, for which amount the Building Committee shall select the required finish hardware.

The doors to be hung on three loose pin bronze finish wrought iron butts of sufficient size to throw them clear of architraves, and are to be provided with good mortise locks, Russell and Erwins or Corbins make, with bronze knobs and escutcheons.

Transom lifts for all transoms.

Bronze sash locks and two sash lifts for all double hung windows.

Outside entrance doors to have cast bronze store door locks.

All top and bottom door bolts to be flush bolts.

THRESHOLDS: Place ½″ thick iron thresholds under outside doors.

PAINTER'S SPECIFICATIONS

The painter is referred to the Carpenter's Specifications for the amount of woodwork to be painted.

Cover all sap, knots and defects in woodwork which is to be painted with a good coat of shellac before priming.

Putty up all nail holes, cracks or defects after priming.

EXTERIOR: Paint all exterior woodwork with three coats of pure linseed oil paint in colors as may be directed.

SHINGLES: All shingles are to be dipped three-fourths of their length in Cabots No. 148, or as good, creosote stain before being put on.

METAL: Paint all tinwork and galv. iron work of roofs, gutters, valleys, etc., and all iron work with two coats of best quality mineral and pure linseed oil paint. Color as may be directed.

INTERIOR: All interior woodwork to be painted, to have three coats of pure linseed oil paint in colors as may be directed. Inside of all sash to be grained to match oak finish.

All interior oak finish throughout the building is to be finished natural. Same must be thoroughly cleaned from discolorations, etc., before applying any finish. The back of all casings, base, etc., are to have a coat of boiled linseed oil before nailing same to wall.

The painter is to inspect all woodwork and floors which are to be finished natural, and if such work is not in proper condition for finishing, he must notify the Superintendent. All the woodwork to be finished natural must be smooth, clean and dry before commencing to finish, and any scratches or cuts across the grain must be obliterated.

Filling—One coat of light paste wood filler, which, when set, shall be thoroughly cleaned off.

Finish—Finish with three coats of best grade interior varnish, sanded between coats and last coat rubbed with pumice stone and oil or water.

ENTRANCE DOORS: Outside entrance doors to have one coat of dark paste wood filler, which, when set, shall be thoroughly cleaned off. Finish with three coats of Spar Finishing Varnish, sanded between coats with fine sandpaper.

FINISH OF FLOORS: Maple floors to have two coats of linseed oil, then rubbed till surplus oil is removed.

Basement cement floors to be finished with two coats cement floor paint.

ALL SASH to be glazed at factory, but any reglazing needed where glass has been broken shall be done by painter, and all glass must be whole at completion of building.

HEATING AND VENTILATION AND PLUMBING to be done under separate contracts while building is under construction and carpenters are to do all necessary cutting, fitting, repairing, or reinforcing that may be required.

PLUMBING SPECIFICATIONS

FOUR-ROOM SCHOOL BUILDINGS, DESIGNS 7 AND 8

Separate bids are to be taken for the plumbing and a certified check for five per cent of amount of bid to accompany each proposal and check is to be made payable to Mr. ————, Chairman of Building Committee, that bidder will within ten days enter into a contract with the Building Committee to make a contract to install plumbing in accordance with specifications and to furnish a Surety Co.'s bond for the full amount of contract price.

Contractor will also be required to give a bond for $300.00 to run one year from date of last payment that his work will stand all natural wear for one year from time of installing plumbing into building.

SUPERINTENDENCE: The Contractor shall work in harmony with and co-operate with contractors for other work on the building to make the whole job a complete and finished one of its kind, and shall afford access to the superintendent for proper inspection of the work both during erection and at the completion.

ERRORS IN PLANS AND SPECIFICATIONS: The drawings herewith submitted and these specifications are intended to co-operate fully, but should a case arise in which they do not, the Architect shall decide the point and his decision shall be binding and final on all parties.

ACCEPTANCE OF BIDS: The Owners reserve the right to reject any or all bids.

BUILDING LAWS:. The Contractor shall consider prevailing building laws as part of these specifications and conformity thereto must be strictly observed.

SEWER PIPES: Run 4″ salt glazed sewer pipes about 5 ft. from rear foundation wall to disposal plant. Joints in sewer pipes to be made with Portland cement and to be wiped smooth on the inside.

SOIL PIPES: Continue the sewer pipes from outside of foundation wall with 4″ extra heavy cast iron soil pipes into basement and back the entire length of same to points where shown. Run 4″ soil pipes to foot of all 4″ stacks. Branches for toilets in basement to be 4″ and for other basement fixtures 2″ soil pipes. All stacks to be properly capped off at the top and connected to roof in water tight manner. At bottom of all stacks and at all bends insert hand hole clean out fitting with brass screw. Also insert same kind of fitting where soil pipes leave basement. Bends in soil pipes to be made with Ys and sanitary T fittings. Joints in soil pipes to be made with double layers of picked oakum and lead and all well calked.

BACK WATER VALVES: All branches in soil pipes for plumbing fixtures in basement to be provided with Palmer back water valves.

MANHOLES: Around main clean out fitting and around all other clean out fittings below basement floor, build brick manholes with cast iron frames and covers set even with basement floor.

CONCEALED WASTE PIPES: All concealed waste pipes under floor and in partitions to be cast iron coil pipes or lead waste pipes with brass fittings and wiped joints. Waste for water closets to be 4″, for sinks, 1½″, and for lavatories, 1¼″. No concealed wrought iron waste pipes will be allowed.

WATER SUPPLY: Connect and run 1″ galvanized iron pipes into basement and to point where branches are taken off. Continue with ¾″ galvanized iron pipes to fixtures with branches of ½″ and ⅜″ galvanized iron pipes.

HOT WATER SUPPLY: Connect cold water supply to storage tank. From tank run ¾, ½ and ⅜″ galvanized iron pipes to all fixtures for hot water in the same manner as for cold water.

CIRCULATION PIPE: From top of all risers run proper sized circulation pipes to basement and connect risers together in a circuit similar to hot water circuit and return to storage tank.

VALVES AND STOP COCKS: Put in gate valve in hot water pipe from tank. Put in brass stop and waste cocks at foot of all risers for hot and cold water and circulation, also gate valve where circulation pipe connects to tank. All fixtures to be provided with stop valves in immediate branches for hot and cold supply pipes.

SILL COCK: Place two sill cocks where directed. Each sill cock to be provided with separate stop and waste cock in basement.

Set up and connect complete the following fixtures where shown on plans or where directed:

One cast iron floor drain in boiler room to receive blow off from steam boiler. Drain to be provided with back water valve.

FIXTURES: Provide and properly set where shown on plans, the plumbing fixtures, trapped, ventilated, and connected to water and sewer.

CLOSETS: Provide and properly set the number of closets shown on plans of the New A-1094 Juvenis Vitroware Syphon Jet Closets, heavy saddle oak seat with heavy box hinge, special N. P. operating valve, N. P. flush pipe and galvanized steel 8x24″ pressure tank and bracket, or of Clows Juvenil M-1869 Madden Patent complete as described in catalogue, or any equally good.

URINAL: Provide and properly set one N-350 3-6 Clow, or as good, one piece porcelain urinal and back with brass beehive strainer, plug, coupling and perforated wash down pipe with loose key stop valve.

LAVATORIES: Provide and properly set four A-164, or as good, with No. 0 Fuller N. P. basin cocks with A-4842 ⅜″ N. P. supply pipes and A-4762 N. P. continuous waste with "S" traps without vent.

SHOWER BATHS: Provide and properly set two A-796 N. P. showers with N. P. brass wastes, strainers and couplings. Also provide and properly set N. P. Curtain rods with rings and duck curtains in front of each shower.

KITCHEN SINK: Provide and properly set where shown one A-1450 one piece enameled iron roll rim sink with high back and N. P. strainer, supported on concealed wall hangers, ⅝″ N. P. compression faucets with adjustable flanges and 1½″ trap to wall.

DRINKING FOUNTAINS: Provide and properly set as shown R-747 Clows porcelain enameled drinking fountains or A-915 Twentieth Century drinking fountains, properly connected to supply and waste pipes. Waste pipes to discharge over urinals.

FIXTURE NUMBERS are taken from J. B. Clow & Son's catalogue and from the Crane "A" catalogue.

Partition for shower bath rooms shall be cement plaster on Herringbone expanded metal lath. Plaster shall be lined up into tile patterns and painted with three coats of white lead and pure linseed oil paint. All toilet room partitions shall be regular oak partitions and doors. All plumbing work must be done in a neat and practical manner and be perfect at completion.

STORAGE TANK: Furnish and place in boiler room one 315 gallon steel tank, to be 36″ in diameter, 6 ft. in length; the shell to be 3/16″ thick; the heads to be 5/16″ thick. The tank to contain a 4 branch return bend 1½″ brass pipe coil. The return bends to be 1½″ extra heavy galvanized malleable iron. The tank must be provided with a manhole in the head; in the head in which is placed the manhole to have two holes tapped for 1½″ standard pipe tread, these holes must be 24″ center to center. Also place two 2″ flanges for the proper circulation of water from the hereinafter specified water heater; connect the brass pipe coil to the steam and return pipes and the heating system with pipe and fittings as may be necessary for the proper circulation of steam and condensation which includes valves on the steam and return pipes. Connect the two 2″ water circulating pipes in tank to the hereinafter specified water heater, also provide one 2″ Crane No. 1126 Water Relief Valve to be properly fitted to the tank.

WATER HEATER: Furnish and set in boiler room one new No. 10 Ideal Junior Water Heater and connect same as specified to the storage tank; connect smoke pipe with damper from heater to the boiler breeching. Connect the water heater and storage tank to the service pipes in the building with the necessary pipe, fittings and valves to make a complete hot water service. Also provide and properly set one Ideal Sylphon tank regulator to control the steam to tank coil. Also provide and properly set one Ideal Sylphon damper regulator to regulate dampers on water heater.

NOTE: Where building is located on low or flat land where fall from building to sewage disposal plants is insufficient, a concrete sewage reservoir or receiving well shall be built at a convenient distance from the building and a 2½″ centrifugal pump used for lifting the sewage and discharge same into sewer leading to sewage disposal plant. A float in the reservoir shall control the gate valve automatically, the pump being located in a dry well beside the sewer reservoir, the pump running all the time; or pump may be located on the bottom of the sewage reservoir or well and have the float shift the belt on the vertical pump shaft, the belt on the vertical pump shaft starting and stopping the pump.

HEATING AND VENTILATING SPECIFICATIONS

FOUR ROOM SCHOOL BUILDING

INSTRUCTIONS TO BIDDERS

1. **FORM OF PROPOSAL, ETC.:** All proposals must be made out in duplicate on the proper form. (See Bid Form.) All prices or sums of money shall be stated in words and in figures. Proposals must be enclosed in a plain envelope, sealed.

All proposals not made out in full or made out in any other manner than above described, will not be considered.

To insure consideration of proposals, plans and specifications must be returned with proposals, or previously.

Any further information regarding the filling out of proposals may be obtained from the Chairman of the Building Committee at any time prior to the date of the receipt of signed bids.

2. **ENTIRE AMOUNT OF BID:** Each bidder shall state in one sum the amount for which he will agree to perform the entire work as set forth on the drawings and these specifications, of which these instructions form a part.

3. **TIME REQUIRED:** Besides the amount as stated above, the bid shall also state the time required for the entire completion of the work.

4. **EXAMINATION OF DRAWINGS, SPECIFICATIONS AND SITE:** Before making his proposal, the bidder shall carefully examine the drawings, the entire contents of the specifications prepared for the work, and the site, so as to make himself thoroughly familiar with all the requirements.

5. **VERBAL INSTRUCTIONS:** Neither the Architect nor the Owner will be held responsible in any manner for the verbal answers given to any inquiries regarding the meaning of the drawings or specifications, or for any verbal instructions, whether by themselves, their employees or others, in advance of the awarding of the contract.

Should any one of the bidders make inquiry regarding any points, which, in the opinion of the Architect, seem vague or insufficiently expressed or shown, each bidder will receive written explanation and descriptions of such points at once.

6. **PROPOSALS RECEIVED AFTER TIME OF CLOSING:** Proposals received after the time of closing will not be considered, but will be returned unopened to bidder.

7. **OWNER'S ACCEPTANCE OR REJECTION OF BIDS:** The owner reserves the right to reject any or all proposals submitted, or to accept such as in his judgment and in their judgment may seem advisable and most advantageous to the proper execution of the work.

8. **CERTIFIED CHECK:** Each bid shall be accompanied by a certified check to equal five per cent of the total of the bid. Checks to be made payable to ....This deposit will be returned to the unsuccessful bidders and to the successful bidder upon his entering into contract with the owner.

9. **SIGNING OF CONTRACT:** The Contractor shall, immediately when required to do so, after receipt of notification accepting his proposal, appear to execute the required contract, and he shall be required to give bond, with satisfactory surety, in a penal sum equal to the entire amount of the contract; such bond to bear the same date as the date of the execution of the contract.

10. **CHANGES:** No change from the plans and specifications is to be made without the consent of the Chairman of Building Committee. The owner reserves the right to change, under the Architect's direction, anything pertaining to this equipment, by adding, omitting or substituting.

All such changes must, however, be accompanied by a written order signed by owner, and when they involve an additional expense, it shall be made for the actual cost and value of the labor and materials necessary, plus ten per cent of same; and when they involve a less expense, it shall be made for the actual cost of labor and materials ordered out, and this shall be deducted from the contract price.

11. **PATENTS:** The Contractor shall save the Owner harmless from any loss or damage at any time arising or growing out of the use of anything covered by patents in the perfomance of his contract.

STEAM HEATING

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1. **GENERAL REQUIREMENTS:** The heating system must be installed in a neat and practical manner and must be noiseless in operation. Every radiator must be filled with steam when there is one pound of steam indicated at the gauge on the boiler.

The steam heating system must be a low pressure gravity circulating system. All condensation from the entire system must return to the boiler without the aid of pump, trap or any other mechanical device not embodied in the plans or specifications.

The heating system includes the boiler, breeching, pipe, radiators, fittings, valves and all material and labor necessary to install a complete steam heating system.

The plans show the size and location of radiators, pipe and valves, which shall be the minimum that shall be used.

2. **BOILER:** Provide and erect in basement where shown on plans, one new Steam Ideal Boiler, or equal to 4,200 sq. ft. heating capacity, including the necessary foundation.

3. **SMOKE BREECHING:** The smoke connection must be taken from the back end of the boiler, to be 15″ in diameter, No. 16 gauge steel, and connect to chimney flue in a neat and practical manner. The connections from the boiler must be fitted with a revolving iron damper made of No. 12 gauge steel. Where breeching enters brick work, furnish flange collar of same material as breeching.

4. **FIRING TOOLS:** Furnish a poker, hoe, steel wire brush, clinker hook and steel coal shovel of standard design and manufacture, made of first quality materials.

5. **BOILER FEED:** Furnish and connect the boiler to the water supply brought to boiler room by Owner. The feed pipe to be ¾″ and fitted with Crane No. 12, or equal, globe valve, and Crane No. 35, or equal, swing check valve. The boiler feed must be connected so that the boiler will receive water when the main steam and return valves are closed. The boiler feed globe valve must be placed at the front end of boiler.

6. **BOILER EQUIPMENT:** Furnish and set properly fitted to boiler, one steam gauge, safety valve, water column, water glass, one pair water glass valves, three gauge cocks and one automatic damper regulator with attachments.

7. **BLOW OFF VALVE:** Furnish and connect one 1¼″ Crane No. 438½, or equal, gate valve to the blow off opening on the boiler and connect with the sewer.

8. **PIPE AND FITTINGS:** All pipe shall be standard black pipe, National Tube Co.'s, or equivalent, all smaller than 1½″, shall be butt welded and 1½″ and larger lap welded. Pipe shall be of sizes shown and shall be sufficient to perform the duty required, reamed so that all internal ends will be tapered smooth. Threads shall be clean cut and true, and of sufficient length to extend into fittings the length of bead and thread. All piping shall be put together with screwed fittings, with unions placed next each valve. Piping shall have not less than ½″ pitch to each 10′ of run in the direction of the flow of steam, except where otherwise specified. Suspend all horizontal piping in a satisfactory manner on approved type of expansion hangers.

All fittings shall be standard first quality gray cast iron, Crane or equal, without imperfections. All unions 2″ and smaller shall be Crane No. 519 R. R., all unions 2½″ and larger shall be flanged unions. When necessary to reduce the openings of fittings, use flush malleable iron bushings. **Cast iron bushings will not be accepted.** All branches to radiators, etc., shall be taken off with nipples and 45° ells pitching back to main, except as otherwise specified. All branches to radiators and risers shall be of pipe one size larger than size of pipe to radiator valve.

The main return pipes dropped to floor as indicated in basement shall have an automatic air valve placed on each drop pipe, air valves to extend to at least 6″ above return drop pipe. The return pipes shall be connected to main return to boiler so that main return valve will close the boiler pressure from all return piping. The main steam valve shall be so arranged that the boiler pressure will be closed from all steam piping.

All risers shall be exposed and placed not more than 4″ center from corresponding wall.

9. **VALVES:** Furnish and properly set on the steam main where shown on plans, one Crane No. 460, or equal, gate valve. Furnish and connect to gate valve and flange union. Also furnish and properly set on return pipe entering the boiler, one Crane No. 460, or equal, gate valve and one Crane No. 366, or equal, check valve and flange union. The gate valves must be arranged so that they can be closed with pressure on the boiler and allow the opening of check valve and flange union.

10. **SLEEVES:** The Contractor shall provide a neatly fitted galvanized iron sleeve through walls and floors to extend full depth to finished surfaces or each ceiling, wall and floor.

11. **CEILING AND FLOOR PLATES:** Furnish on each exposed pipe extending through floor, ceiling and wall, one Beaton Nickel plated plate.

12. **RADIATORS:** Furnish and properly set the radiators in each and every room as indicated on plans. The radiators must be Rococo Wall and Rococo Ornamental Pattern, or equal. Each radiator must contain the amount of square feet heating surface as indicated on the plans.

13. **RADIATOR VALVES:** Furnish and connect each radiator suspended from wall or ceiling and all radiators set on floor with a Crane No. 220, or equal, self adjusted packed N. P. union angle valve with wood wheel.

14. **AIR VALVES:** Furnish and connect to each radiator one Crane, or equal, automatic air valve, also connect to each drop pipe on return main, one Crane, or equal, automatic air valve.

15. **PIPE COVERING:** Cover all piping in basement with ¾″ asbestos air cell covering, neatly banded every 2 ft. (Submit sample for approval.) Cover all fittings with a 1″ coat of plastic asbestos cement neatly covered with 6 oz. canvas duck.

16. **BOILER COVERING:** Cover boiler with a one-inch coating of plastic asbestos cement, over which apply a heavy coating of ½″ wire mesh. Over wire mesh apply a second coat of plastic cement one inch thick. Cover this coating with 18 oz. duck neatly and substantially applied.

17. **BRONZING AND PAINTING:** All radiators throughout the building shall be given two coats of Berry Bros. Pale Bronze. The exposed piping shall be given two coats of metallic paint of such color as selected by Owner.

18. **TEMPORARY HEAT:** The Contractor must submit a separate estimate for the connection of radiators for temporary heat, subject to the order of the Owner.

19. **TEST:** The entire heating system must be subjected to a test of 15 lbs. steam pressure as indicated at the gauge on the boiler, the test to continue for a period of four hours.

20. **GUARANTEE:** The Contractor must guarantee that the plant shall be installed as shown on the plans and specifications. He shall maintain and keep the entire plant in repair for a period of one year after its final acceptance by the Owner, providing such repairs are due to faulty construction or imperfect materials provided and installed by the Contractor. Should any defect be found by the Owner, the Contractor must, upon written order, proceed to repair and make good any such defect in not more than ten days from receipt of said order. This must include all incidental repairing of the finish of the building due to tearing out or reconstruction.

21. **WRITTEN GUARANTEE:** The Contractor must submit a written guarantee which shall include the above guarantee, to the Owner.

ENGINE

1. **ENGINE:** Provide and properly set one 8 H. P. Foreman, or equal, gasolene engine. Speed 300 revolutions per minute, Cycle 4, Stroke 10 inches, Bore 6¾ inches, Fly wheels 42 inches diameter, 3 inch face, Pulley 14 inch, 8″ face, water cooled, color red. The engine shall be set complete with the necessary fixtures and tools for operating. The engine foundation shall be constructed with a good grade of concrete and shall be 12″ longer and wider than the engine base. The foundation shall be not less than 2 feet thick and shall contain the necessary anchor bolts equal to the diameter of anchor bolt holes in engine base.

2. **SHAFTING:** Provide and properly set one 1 11/16″ Amanco, or equal, line shaft, which shall have four Friction Clutch Pulleys ranging from 4 to 12 inches in diameter. The line shaft shall be suspended from basement ceiling with three Amanco, or equal, ring oiling hangers. Bearing babbitted and broached.

The counter shaft in the manual training room shall be 1 7/16″ Amanco, or equal, and shall be suspended from ceiling with three Amanco, or equal, ring oiling hangers, and shall have the necessary pulleys as may be required.

The counter shaft in boiler room shall be 1 3/16″ Amanco, or equal, and shall be suspended from ceiling with two Amanco, or equal, ring oiling hangers.

3. **BELTING:** Provide and properly set the necessary belting for each machine. The belting shall be of proper size and strength as approved by the Owner.

4. **WATER PUMP:** Provide and properly set one Allrite, or equal, pump, 2½″ cylinder equal to 600 gallons water per hour. Provide a suitable foundation and connect pump to well and water system.

5. **PRESSURE TANK:** Provide and properly set one black steel tank, 48″ diameter, 16 ft. long. The tank shall be ¼″ thick. The tank heads shall be ⅜″ thick. The tank shall be tested to 125 lbs. pressure per square inch and shall be tight in all seams and joints.

6. **PRESSURE TANK EQUIPMENT:** Provide a sufficient number of flanges for water service inlets and outlets, and shall have a manhole and plate large enough to allow access for cleaning. Provide the necessary tappings for water pressure gauge and water glass gauge valves.

Provide and properly set one pressure gauge not less than 4½″ in diameter.

Provide and properly set one set water glass gauge valves and glass. The water glass gauge to be arranged for the tank to set in a horizontal position, set on approved supports to be not less than 4″ between tank and floor.

Provide and properly set one 1¼″ Crane No. 438, or equal, gate valve for draining-tank to sewer or catch basin.

VENTILATING SPECIFICATIONS

FOR TYPICAL SCHOOL, DESIGN 7

The ventilation of this school building must be accomplished by means of a blower system. There shall be placed in basement as shown on plans a blower, engine and tempering coils with necessary accessories. The air is to be drawn through the basement window through the tempering coils to the fan which will force same through the galvanized iron duct leading to the various rooms. This air will be blown into the room at a height of approximately 8 ft. above the floor. There shall also be placed in the walls vent ducts leading to the attic which will allow the vitiated air to escape near the floor in each room to the attic.

The apparatus is to be as follows:

PLENUM FAN: One No. 5 Full Housed Sirocco fan or as good, having a capacity of 6,000 cu. ft. of air per minute at .6 oz. pressure when running at 350 R. P. M., requiring not more than 2 H. P. Blower to be equipped with pulley of suitable size and connected to engine with a 3″ double leather belt. This blower must be of the very best construction throughout and fully equal to the standard specified and of similar construction.

TEMPERING COILS: Four groups of No. 12 40″ Vento radiation, containing a total of 516 sq. ft. of heating surface. Loops for each group are to be placed on 5″ centers. Each group shall be tapped for 2″ supply and 1″ return. Each connection to be individually valved.

These tempering coils are to be covered with No. 22 gauge black iron casing, same to extend to fresh air window and also to fan inlet.

Suitable by-pass damper shall be placed underneath tempering coils for at least 6 sq. ft. area. This damper to be arranged on trunion and provided with adjusting device so it may be set in any desired position.

The air must be heated to a temperature of at least 70° Fahr. when the outside temperature is 40° below zero.

GALVANIZED IRON WORK: Contractor shall furnish and install all galvanized iron work complete practically as shown on drawing, same to be constructed of No. 24 gauge galvanized iron. At the base of each vertical riser shall be placed a volume damper with adjusting device so that the air may be regulated to any room. All elbows shall be of easy radius. The fresh air ducts to each room shall be provided with registers, having a chain attachment so they may be easily regulated.

All of the vent ducts leading to the attic shall be connected with galvanized iron pipe at one central point, which shall connect to a 36″ globe ventilator placed on roof. This ventilator shall be provided with damper and adjusting device and with suitable cord or chain extending to the basement so that it may be easily adjusted from that point.

FOR TYPICAL SCHOOL, DESIGN 8

This specification is to be same as Specification for Design 7, except the blower is to be a No. 6 Sirocco fan manufactured by the American Blower Company, or fully equal, having a capacity of 8,000 cu. ft. of air per minute at ½ oz. pressure and running at 270 R. P. M., requiring not more than 2 H. P. for its operation.

The tempering coils are to consist of four groups of No. 13 40″ Vento, having a total of 559 sq. ft. of heating surface.

BID FORM

Date..*191*.....

("A")—Propose to furnish all materials and perform all labor in connection with the Steam Heating for the..

....*Minn.,*

according to the plans and specifications prepared by..............................*Architect, complete for the sum of*..*($*..................*)*

("B")—The time required for the entire completion of the work from the date of signing of the contract is..*working days.*

(Signed)..

(Address)..

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